

To: CN=Timothy Connor/OU=DC/O=USEPA/C=US@EPA[]
Cc: []
From: CN=Tina Laidlaw/OU=MO/OU=R8/O=USEPA/C=US
Sent: Thur 10/9/2008 10:20:12 PM
Subject: Fw: Nutrient Criteria Affordability Mtng-follow up
[AffordabilityGroup_Sept15-08.pdf](#)
[PublicEntity_MissoulaCaseStudy_EPACostmodel_Vol3.xls](#)
[PrivateEntity_LewistownTanningInc_Casestudy_EPACostmodel_vol3.xls](#)
[PublicEntity_CircleCaseStudy_EPACostmodel_Vol3.xls](#)
<http://www.epa.gov/waterscience/standards/econworkbook/pdf/complete.pdf>

Tim,

Below are some materials related to MT's affordability workgroup meeting. If you have an minute to give me a call, I'd love to chat with you about this topic.

Tina

Tina Laidlaw
USEPA Montana Office
10 West 15th Street, Suite 3200
Helena, MT 59626
406-457-5016

----- Forwarded by Tina Laidlaw/MO/R8/USEPA/US on 10/09/2008 09:54 AM -----

"Suplee, Mike" <msuplee@mt.gov>
09/16/2008 02:26 PM
To Tina Laidlaw/MO/R8/USEPA/US@EPA
cc
Subject FW: Nutrient Criteria Affordability Mtng-follow up

From: Suplee, Mike
Sent: Tuesday, September 16, 2008 11:35 AM
To: Teegarden, Todd; Blend, Jeff; 'Gerald Mueller'; Burton, Tim; 'John Wilson'; 'pworks@blackfoot.net'; 'esal21@juno.com'; 'Jim Jensen'; 'Allenassociates@qwestoffice.net'; 'Brianna@clarkfork.org'; Edgcomb, Jim; 'smurphy@m-m.net'; 'Dave Aune'; 'Dude Tyler'
Cc: Bukantis, Bob; Blend, Jeff; LaVigne, Paul
Subject: RE: Nutrient Criteria Affordability Mtng-follow up

Hi Everyone;

Per your request from yesterday's meeting, attached are the following documents:

1. The three example case-study spreadsheets. We went over the one for Circle during the meeting. Please bear in mind that these are only test examples and they do not currently reflect the changes you recommended to us for improving the Secondary Indicators.

2. My PowerPoint presentation.

Also, below is the internet link to the 1995 EPA document "Interim Economic Guidance for Water Quality Standards Workbook". This document is the basis of our spreadsheets and the overall approach to assessing affordability that DEQ is recommending.

Thanks to all of you for your helpful suggestions and thoughts. I look forward to our next meeting on October 15th.

Michael Suplee, Ph.D.
Water Quality Standards Section
Montana Department of Environmental Quality

<http://www.epa.gov/waterscience/standards/econworkbook/pdf/complete.pdf>

Proposed Affordability Assessment Procedure to Accompany the Base Numeric Nutrient Standards

Prepared By

*Jeff Blend, Paul LaVigne, and Michael Suplee
Montana Department of Environmental Quality*

*Nutrient Criteria Affordability Advisory Group
Meeting 1: September 15, 2008*

The Draft Numeric Nutrient Criteria

- Science and justification for the criteria will be presented in a statement-of-basis paper (in peer review)
- **Overall:** Nutrient concentrations that protect sensitive beneficial water uses are low:

Typical concentrations in western MT:

- Total P: 0.05 mg/L
- Total N: 0.3 mg/L

Typical concentrations in eastern MT:

- Total P: 0.12 mg/L
- Total N: 1.3 mg/L

- Current waste-water technologies cannot meet all of these criteria
 - Low-flow streams with limited dilution make this even more difficult

Economic Considerations

As a wastewater facility works to achieve lower and lower nutrient concentrations, the cost to achieve those concentrations goes up nearly exponentially

Economic Considerations

- Federal Regs: Not intended to result in WQ standards so stringent that compliance would cause severe economic impacts on a community
- Economic impacts from meeting standards must be “substantial” and “widespread” if standards are to be waived
 - Applies to treatment beyond technology-based regulations
 - CWA options: remove use, create use subcategories, variance
- 75-5-301 (2) (a), § MCA: *formulate and adopt standards of water quality, giving consideration to the economics of waste treatment and prevention.*

Economic Considerations-Example

- Philipsburg, Montana
 - 930 people
 - Aging lagoon treatment system, can't accommodate more growth
 - periodically was out of compliance
- New mechanical plant (BNR) and clean-up of lagoons: \$6,131,987.00
- Per-household sewer rates would rise from ~\$15/month to \geq \$70/month

Evaluating an Affordability-Based Approach

- Studies completed for DEQ:
 - 2006 (case studies, recommended methodology)
 - 2007 (cost of different treatment technologies)
- EPA's "*Interim Economic Guidance for Water Quality Standards*" (1995) was recommended
- Internal DEQ working group
 - Refined EPA methodology for Montana use
 - Methodology is spreadsheet-enabled
 - Separate evaluation methods for public vs. private sector
 - Nondeg can also be addressed

Economic Considerations- EPA Method

Step 1: Impact must be substantial.

Step 1a: Use “Municipal Preliminary Screener”

Municipal Preliminary Screener (MPS) = Mean total pollution
control cost per household / median household income
(includes existing user cost)

- MPS < 1% : Cost bearable, no further analysis needed
- MPS 1-2%: Midrange impacts
- MPS > 2%: High cost impacts; unreasonable cost for many households

Step 1b: If Midrange or High cost, carry out more detailed substantial tests to confirm substantial impacts would occur on the community

Step 2: Impact must be widespread. EPA methodology not explicit; DEQ refined it for Montana use

Missoula Example

- Missoula's economy & population are booming
- Tertiary Treatment
 - Upgrade would cost \$20 million in up front costs and \$4.4 million annually in O & M.
 - Per household cost would rise from \$200/yr (current) to \$393/yr.
- Municipal screener: Mid-range impact (1.17% of median household income)
- Further substantial tests: Missoula is financially strong. 'Substantial Matrix' shows city can afford this level of treatment.
- **Conclusion:** No Substantial impacts. Further analysis unnecessary

Circle Example

- Circle is losing population, has a stagnant economy
- Lagoon System
 - Existing lagoon system needs upgrade to meet standards
 - Upgrade would cost Circle \$2 million in up front costs (plus the same in grants) \$0.6 million annually in O&M
 - Per household cost would rise from \$216/yr (current) to \$1,655/yr
 - Reason: small number of households
- Municipal screener: 5.15% of median household income to pay for wastewater fees
- Further substantial tests: Circle is financially “average”. ‘Substantial Matrix’ suggests Circle may encounter economic hardship

GO TO WIDESPREAD TEST



- Widespread Test shows Circle would likely have widespread impacts
- **Conclusion:** Circle will experience substantial & widespread impacts

Lewistown Tannery Example

- End-of-pipe technology: \$950,000 in capital costs, \$188,000/yr O&M
- Substantial:
 - Profit test: Company profit would be significantly lowered, by 5.5%, but would remain positive
 - Profitability would fall to lower end of industry average after pollution control
 - Liquidity, Solvency, Leverage: Company could cover pollution control costs. Effect would likely be significant, but would probably not shut down or curtail the business
- Widespread:
 - Few widespread impacts expected if business had to pay pollution control costs. Lewistown is doing average to good, financially. Company provides a very modest number of local jobs
- Conclusion: Company can probably afford the pollution control. Further talks may be necessary to determine how it might pay for the costs without lowering its profit so much

Observations about the Approach

- Smaller towns will likely have a harder time paying for new wastewater treatment due to small number of households. Large towns benefit from economies of scale
- Economic test for private sector is more of a judgment call
- The S & W tests will probably come into play mainly for mid-sized and large communities
 - Small communities will very often be able to eliminate their surface water discharges altogether
 - About 50 WWTPs across medium-sized MT communities (1000-10,000 people)
 - 7 large communities

Substantial & Widespread Impacts — Remedies

And if communities have S&W impacts?

(Options: Remove designated use, use subcategories, variance)

- Variance is better option because:
 - Designated water use not removed — retained as goal, creates review process
 - Applies only to parameter's infeasible to achieve
 - EPA Headquarters and Region VIII agree it's a better choice
 - Time limit (in practice) can be up to 20 years
 - Variance would need to be re-justified every 3-5 years
 - Allows time for technology to catch up, become less expensive

Substantial & Widespread Impacts — Remedies

- If a community *will* experience substantial & widespread impacts:
 - DEQ recommends community pay 2% of MHI (after taking into account benefits received from grants) to meet water quality standards, because:
 - EPA recommended threshold
 - Roughly 0.9-2.5% of MHI will often be spent anyway, just to meet National Secondary (technology) Standards for wastewater treatment
 - 2% should not overly burden communities

Upfront Public Input on Process

DEQ will consider this Advisory Group's conclusions when setting affordability thresholds and making recommendations to the Board of Environmental Review

Using the Affordability-Based Approach

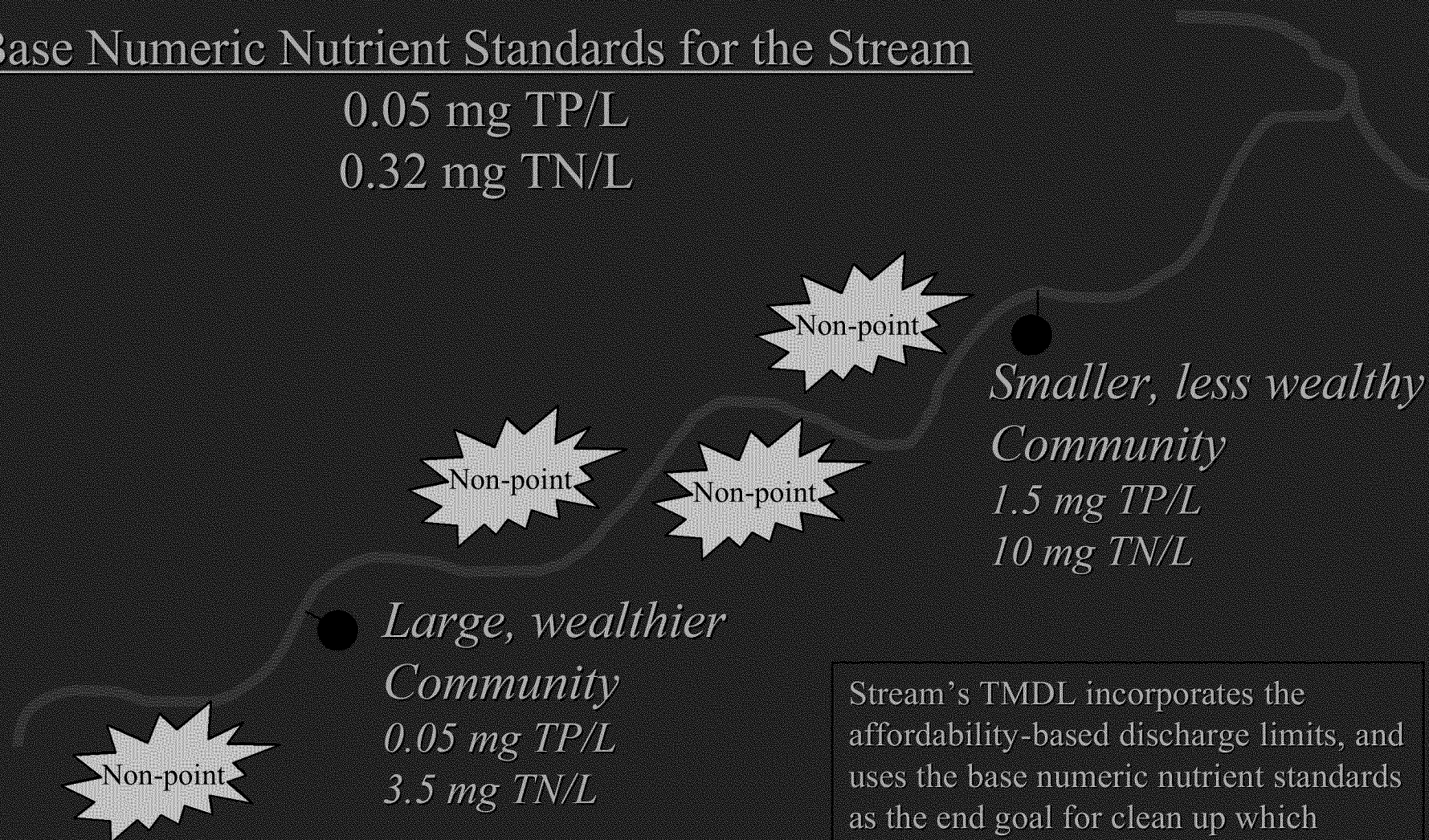
- All reasonable approaches would be pursued to avoid using affordability-based variances
- DEQ will do case-by-case alternative analyses
 - Land application
 - Total contribution to water quality problem (TMDL)
 - <5%, communities not required to meet base nutrient criteria?
 - Pollutant Trading
 - Etc.

How This Approach Would Look Along a Stream

Base Numeric Nutrient Standards for the Stream

0.05 mg TP/L

0.32 mg TN/L



Stream's TMDL incorporates the affordability-based discharge limits, and uses the base numeric nutrient standards as the end goal for clean up which includes addressing non-point sources

What DEQ Would Like the Group to Specifically Address

Public Sector Questions:

- Thoughts on using *median* household income? (Note: the median is currently used as the basis for assessing financial need by funding agencies in Montana.)
- Is the DEQ & EPA recommended 2% MHI threshold for affordability set at a reasonable level?
- Your thoughts on the widespread evaluation categories and process?

Private Sector Questions:

- Are the approaches for evaluating private-sector profit margins reasonable?

Thank You

- Questions?

Supplementary Information

Assessment of Substantial Impacts Matrix

	Minicipal Preliminary Screener		
	Less than 1%	1% to 2%	Greater than 2%
Secondary score			
Less than 1.5	?	X	X
Between 1.5 and 2.5	\$?	X
Greater than 2.5	\$	\$?

Instructions: Review the instructions below for an overview of each step that needs to be taken for the economic analysis of a public facility. Then, start at Worksheet A and work through each of the worksheets until you finish the analysis. For a Non-Degradation analysis, go directly to the last tab. The next tab--the 'Summary Worksheet' tab before Worksheet A--is to be filled out after you work through each worksheet in order to summarize your results.

Summarized below are the steps that need to be taken for the economic analysis of a public facility. Also provided to the right is a flowchart that summarizes those same steps. The complete EPA Guidance for Water Quality Standards can be found at <http://www.epa.gov/waterscience/standards/econworkbook/>

OVERALL STEPS SUMMARY

NOTES

Step 1: Verify Project Costs and Calculate the Annual Cost of the Pollution control project

Step 2: Calculate Total Annualized Pollution Control Costs Per Household

Step 3: Calculate and Evaluate the Municipal Preliminary Screener Score-- identifies only entities that can pay for sure

If the public entity passes a significant portion of the pollution control costs along to private facilities or firms, then the review procedures outlined in Chapter 3 of this workbook should also be consulted to determine the impact on the private entities.

Step 4: Apply the Secondary Test - This measurement incorporates a characterization of the community's current financial and socioeconomic well-being

The ability of a community to finance a project may be dependent upon existing financial conditions within that community.

Step 5: Assess where the community falls in The Substantial Impacts Matrix - This matrix evaluates whether or not communities are expected to incur **substantial** economic impacts due to the implementation of the pollution control costs. If the applicant cannot demonstrate substantial impacts, then they will be required to meet existing water quality standards.

The evaluation of substantial impacts resulting from public entity compliance with water quality standards includes two elements, 1) financial impacts to the public entity and 2) current socioeconomic conditions of the community. Governments have the authority to levy taxes and distribute pollution control costs among households and businesses according to the tax base. Similarly, sewage authorities charge for services, and thus can recover pollution control costs through users fees. In both cases, a substantial impact will usually affect the wider community. Whether or not the community faces substantial impacts depends on both the cost of the pollution control and the general financial and economic health of the community.

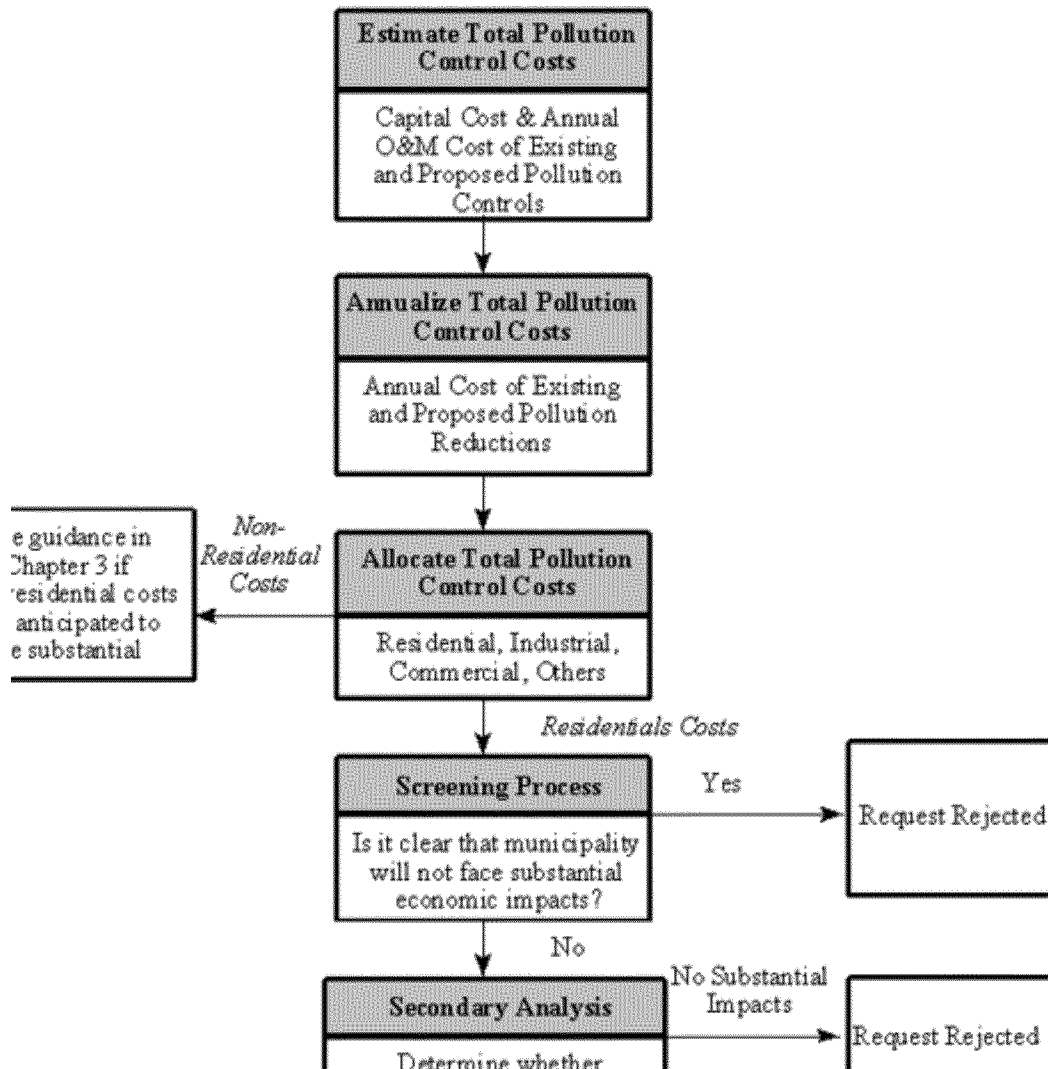
Us
(
non-
are
b

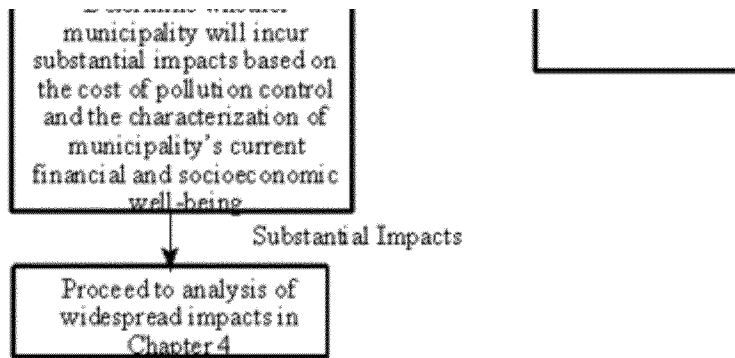
Step 6: If impacts are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be **widespread** (Go to "DEQ Widespread Criteria" tab). Estimated *changes* in socio-economic indicators will be used to determine whether widespread impact has occurred

needs to be taken for the
rough each of the
directly to the last tab.
out after you work

a public facility. Also
e EPA Guidance for Water
workbook/

**Figure 2-1:
Measuring Substantial Impacts
(Public Entities)**





you reach for each step for your analysis. This is help to give a simple overview of what you found out.

OVERALL STEPS SUMMARY

the Annual Cost of the Pollution control project \$17.86 million total in capital costs, \$4.35 million in O&M costs /\$5.7 million per year in annualized costs

Step 2: Calculate Total Annualized Pollution Control Costs Per Household \$379 per households for existing and new costs

Step 3: Calculate and Evaluate the Municipal Preliminary Screener Score-- identifies only entities that can pay for sure 1.13% for Missoula households which is in the Mid-range. We proceed to the secondary test.

Step 4: Apply the Secondary Test - This measurement incorporates a characterization of the community's current financial and socioeconomic well-being The secondary score for Missoula came out to be 2.67 which is strong (Missoula has a strong financial and socioeconomic well-being

Step 5: Assess where the community falls in The Substantial Impacts Matrix - This matrix evaluates whether or not communities are expected to incur **substantial** economic impacts due to the implementation of the pollution control costs. If the applicant cannot demonstrate substantial impacts, then they will be required to meet existing water quality standards. Missoula can afford to pay the water treatment costs according to the matrix. Thus, no variance should be given nor is the widespread test needed.

Step 6: If impacts are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be **widespread** (Go to "DEQ Widespread Criteria" tab). The Widespread test is not necessary. However, it was run anyway, and it was determined that impacts would not be widespread.

Step 7: State the Final Conclusion Missoula does not need a variance for their upgrade.

sults that you reach for each step for

Worksheet A--Pollution Control Project Summary Info

For the purposes of this workbook, a **public entity** refers to any governmental unit that must comply with pollution control requirements in order to meet water quality standards. The most common example is a municipality or sewage authority operating a publicly owned treatment works (POTW) that must be upgraded or expanded. Municipalities, however, may also be required to control other point sources or nonpoint sources of pollution within their jurisdiction.

Note: The most cost effective project is preferred. Public entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment. Specific types of pollution prevention activities that should be considered are found in Chapter 2 of the EPA Guidance.

Whatever the approach, the applicant must demonstrate that the proposed project is the most appropriate means of meeting water quality standards and must document project cost estimates. If at least one of the treatment alternatives that meets water quality standards will not have a substantial financial impact, then the community should not proceed with the analysis presented in the rest of this workbook.

Current Capacity of the Pollution Control System (skip this for Non-Deg)	20 MGD
Design Capacity of the Pollution Control System	22 MGD
Current Excess Capacity % (skip this for Non-Deg)	10%
Expected Excess Capacity after Completion of Project %	75%
Projected Groundbreaking Date	Jan-09
Projected Date of Completion	Jan-10

Please describe the pollution control project being proposed and how the project meets water quality standards:

bills. This will help give the plant additional capacity for an expanding Missoula population, and allow it to still meet nutrient standards.

Please describe the other pollution control options considered, explaining why each option was rejected. Explain how each alternative would have met water quality standards.

side of town rather than expand current system--this was more expensive and less efficient and required a lot of new large water pipe to be installed

Is the proposed project the least expensive that can be used to meet the water quality standards goals? If not, give reasons why it is not.

Yes

ment of the current plant and capture the methane to help power a turbine that brings down plant electricity bills.
e plant additional capacity for an expanding Missoula population, and allow it to still meet nutrient standards.

on the west side of town rather than expand current system--this was more expensive and less efficient and
large water pipe to be installed

Worksheet B-Calculation of Total Annualized Project Costs

Note: The capital portion of project costs is typically financed over approximately 20 years, by issuing a municipal debt instrument such as a general obligation bond or a revenue bond. Local governments may also finance capital costs using bank loans, state infrastructure loans (revolving funds), or federal subsidized loans (such as those offered by the Farmers Home Administration)

If project costs were estimated for some prior year, these costs should be adjusted upward to reflect current year prices using the average annual national Consumer Price Index (CPI) inflation rate for the period

Capital Cost of Project	\$20,000,000	
Other One-Time Costs of Project (Please List, if any):	\$0	
New pipe installed	\$2,000,000	
Capture of methane and turbine	\$800,000	
New wiring at plant	\$60,000	
	\$0	
Total Capital Costs (Sum column) \$ (1)	\$22,860,000	
Portion of Capital Costs to be Paid for with Grant Monies \$ (2) (Paul)	\$2,000,000	identified in the PER
Capital Costs to be Financed [Calculate: (1) - (2)] \$ (3)	\$20,860,000	
Type of financing (e.g., G.O. bond, revenue bond, bank loan)		
Interest Rate for Financing (expressed as decimal) (i)	0.06	The interest rate
Time Period of Financing (in years) (n)	20	
Annualization Factor = $i / [(1+i)^n - 1]$ (or see Appendix B) (4)	0.08718	depending on funding source. SRF is 125%
Annualized Capital Cost [Calculate: (3) x (4)] (5)	\$1,818,670	
<u>B. Operating and Maintenance Costs</u>		
Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below and state in terms of dollars per year)	\$4,350,000	
	\$0	
	\$0	
	\$0	
Total Annual O & M Costs (Sum column) \$ (6)	\$4,350,000	
<u>C. Total Annual Cost of Pollution Control Project</u>		
Total Annual Cost of Pollution Control Project [(5) + (6)] \$ (7)	\$6,168,670	

*g a municipal debt instrument such as a general
ans, state infrastructure loans (revolving funds), or*

current year prices using the average annual national

This should be a realistic amount and should be
identical to financing plans identified in the PER

te should reflect the type of debt instrument likely to be used.

loan coverage should be included - this applies to
revenue bonds and varies between 110 to 125%
depending on funding source. SRF is 125%

funding sources are Rural Development (U.S. Dept. of Ag.) -
they require 115% coverage - I think - and SRF. We require
125% coverage on all revenue bonds. You could probably just
roll this into annual debt, but if you tried to back calculate how
much a community could afford, it may complicate things.

US bonds are tax-backed. The
ment (U.S. Dept. of Ag.) - they
ire 125% coverage on all revenue
al debt, but if you tried to back
, it may complicate things.

Worksheet C-Calculation of Total Annual Pollution Control Costs Per Household

A. Current Pollution Control Costs:

Current sewer rate

Total Annual Cost of Existing Pollution Control \$ (1)	\$6,400,000
Amount of Existing Costs Paid By Households \$ (2)	\$6,400,000
Percent of Existing Costs Paid By Households %(3)	100.00%
Number of Households* (4)	32,000
Annual Cost Per Household [Calculate: (2)/(4)] \$ (5)	\$200

* Do not use number of hook-ups.

B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

- a) Yes [fill in percent from (3)] percent.(6a) 100.00%
- b) No, they are expected to pay _____ percent.(6b) _____
- c) No, they are expected to pay based on flow. (Continue on Worksheet C, Option A-- See below) _____

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B] \$ (7)	\$6,168,670
Proportion of Costs Households Are Expected to Pay [(6a) or (6b)] (8)	100.00%
Amount to Be Paid By Households [Calculate: (7) x (8)] \$ (9)	\$6,168,670
Annual Cost per Household [Calculate: (9)/(4)] \$ (10)	\$193

C. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control Per Household (5) + (10) \$ (11)	\$393
---	-------

Worksheet C: Option A---Flow based (Not Applicable for Missoula)

Calculation of Total Annual Pollution Control Costs Per Household--Flow based

A. Calculating Project Costs Incurred By Households Based on Flow

Expected Total Usage of Project (eg. MGD for Wastewater Treatment)	_____	(1)
Usage due to Household Use (MGD of Household Wastewater)	_____	(2)
Percent of Usage due to Household Use [Calculate: (2)/(1)]		(3)
Total Annual Cost of Pollution Control Project	\$ _____	(4)
Industrial Surcharges, if any	\$ _____	(5)
Costs to be Allocated [Calculate: (4) - (5)]		(6)
Amount to Be Paid By Households [Calculate: (3) x (6)]		(7)
Annual Project Cost per Household [Calculate: (7)/Worksheet C, (4)]		(8)

C. Total Annual Pollution Control Cost Per Household

Annual Existing Costs Per Household [Worksheet C, (5)]	\$200	(9)
Total Annual Cost of Pollution Control Per Household [(8) + (9)]		(10)

Worksheet D-Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

Total Annual Pollution Control Cost per Household/Median Household Income X 100

A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or \$ (1) Worksheet C, Option A (10)]

\$393

Median Household Income* \$ (2)

(use CPI to update income number to current year)

\$33,669

should be identic

Municipal Preliminary Screener (Calculate: [(1)/(2)] x 100) %(3)

B. Evaluation of The Municipal Preliminary Screener

1.17%

Impact level is (Little, mid-range, large)

Mid-

Range

Continue on to secondary test

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

Little Impact

Less than 1.0%

Mid-Range Impact

1.0% - 2.0%

Indication of no substantial economic impacts

Proceed to Secondary Tests

al to that stated in PER

Large Impact
Greater than 2%



Worksheet E-Data Used in the Secondary Test

community. Use the latest data available for the community or other public jurisdiction being analyzed.

A. Data Collection

Data	Potential Source
Direct Net Debt--Debt Issued directly by the local jurisdiction (1)	Community Financial Statements Town, County or State Assessor's Office \$_____
Overlapping Debt (such as school districts)? (2)	Community Financial Statements Town, County or State Assessor's Office \$_____
Market Value of Property within the community or service area (3)	Community Financial Statements Town, County or State Assessor's Office \$_____
Bond Rating-(if available) (4)	Standard and Poors or Moody's _____
Community Unemployment Rate (5)	 _____%
National Unemployment Rate (6)	 4.7% (6)

Montana CEIC

National Unemployment Rate (6)	Montana CEIC	4.7% (6)
Community Median Household Income for 2006 (7)		\$ _____
State Median Household Income (8)	Montana CEIC	\$37,307 for State of Montana
Property Tax Collection Rate (Indicator of the efficiency of the tax collection system--compares the actual amount collected from property taxes to the amount levied) (9)	Montana CEIC Community Financial Statements	_____ %
Property Tax Revenues (10)	Town, County or State Assessor's Office Community Financial Statements	\$ _____
Full Market Value of taxable property	Town, County or State Assessor's Office	\$ _____

B. Calculation of Indicators

1. Overall Net Debt as a Percent of Full Market Value of Taxable Property

Overall Net Debt (Calculate: (1) + (2)) (11) \$ _____

Overall Net Debt as a Percent of Full Market Value of Taxable Property (Calculate: [(11)/(3)] x 100) (12) _____ %

2. Property Tax Revenues as a Percent of Full Market Value of Taxable Property

Property Tax Revenues as a Percent of Full Market Value of Taxable Property (Calculate: [(10)/(3)] x 100) (13) _____ %

ates the community's ability to obtain financing and describes the socioeconomic health
sdiction being analyzed.

Value	Source
\$44,923,000	Becky Christians (406) 552-6107, City of Missoula, Assistant Finance Director
\$22,216,000	Becky Christians (406) 552-6107, City of Missoula, Assistant Finance Director
\$4,340,261,600	" "
AAA-(S&P)	" "
2.9%	Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics Bureau of Labor Statistics
4.7%	

	http://www.bls.gov /
4.7%	(202) 606-6392
\$33,669	Susan Ockert- CEIC extracted from Decision Data resources
\$37,307	Susan Ockert- CEIC extracted from Decision Data resources
99.20%	Becky Christians (406) 552-6107, City of Missoula, Assistant Finance Director
\$21,856,338	Tax Year 2007 Source: DOR- TPR Mary Craigle
\$4,340,261,600	Tax Year 2007 Source: DOR- TPR Mary Craigle

\$67,139,000

1.55%

0.50%

Worksheet F- Calculating the Secondary Score

The Secondary Test is designed to build upon the characterization of the financial burden identified in the Municipal Preliminary Screener. The Secondary Test indicates the community's ability to obtain financing and describes the socioeconomic health of the

Remember, if one of the debt or socioeconomic indicators is not available, average the two financial management i Please record the scores in the final column. It will sum the scores and compute an average.

Table 2-1 Secondary Indicators

		Secondary Indicators			
		Indicator	Weak*	Mid-Range**	Strong***
Debt Indicators		Bond Rating (if available)	Below BBB (S&P)	BBB (S&P)	Above BBB (S&P) or Baa (Moody's)
			Below Baa (Moody's)	Baa (Moody's)	
		Overall Net Debt as Percent of Full Market Value of Taxable Property	Above 5%	2%-5%	Below 2%
SocioEconomic Indicators		Unemployment	More than 1% above National Average	National Average----4.7%	More than 1% below National Average
		Median Household Income	More than 10% below State Median	State Median-- \$37,307	More than 10% above State Median
Financial Management Indicators		Property Tax Revenues as a Percent of Full Market Value of Taxable Property	Above 4%	2%-4%	Below 2%
		Property Tax Collection Rate	< 94%	94% - 98%	> 98%

* Weak is a score of 1 point

** Mid-Range is a score of 2 points

*** Strong is a score of 3 points

SUM:

AVERAGE:

<http://www.epa.gov/waterscience/standards/econworkbook/table21.html>

burden than the financial management indicators. Consequently, if one of the debt or socioeconomic indicators is not available, the applicant should average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators. This averaging is necessary so that undue weight is not given to the financial management indicators.

0011186

use this averaged value as a single indicator with the remaining indicators. This averaging is necessary so that undue weight is not given to the financial management indicators.

indicators and use this averaged value as a single indicator with the remaining indicators.

Missoula

Score
3
3
3
1
3
3

Enter Bond Rating Score in box at left

16

2.67

of the six indicators, they must appropriate or not available. Since n to the community, the debt and sures of burden than the financial t or socioeconomic indicators is cial management indicators and maining indicators. This averaging ancial management indicators.

.....
remaining indicators. This averaging
financial management indicators.

Assessment of Substantial Impacts Matrix

Table 2-2

Assessment of Substantial Impacts Matrix

	Municipal Preliminary Screener		
	Less than 1%	1% to 2%	Greater than 2%
Secondary score			
Less than 1.5	?	X	X
Between 1.5 and 2.5	\$?	X
Greater than 2.5	\$	\$?

Result: however, we will do a Widespread determination anyway for the practice.

X-Cannot pay due to hardship

?-Borderline, undetermined

\$-Can pay

Communities falling into either the "X" or the "?" category should proceed to Chapter 4 to determine whether the impacts are also expected to be widespread.

For communities that fall into the "?" category, if the results of both the Secondary Test and the Municipal Preliminary Screener are borderline, then the community should move into the category closest to it. Take, for example, a community that falls into the center box, with a cumulative assessment score of between 1.5 and 2.5 and a percent of median household income (MHI) between 1.0 and 2.0. If the cumulative score was 1.6 and the percent of MHI was 1.8, then the community should be considered to fall into one of the adjacent "X" categories. If results are not borderline, other factors such as the impact on low or fixed income households, the presence of a failing local industry, and other projects the community would have to forgo in order to comply with water quality standards should be considered. Relevant additional information might include information collected from interviews with municipal financial officers, special reports on industry trends that may affect local employers, and specific financial and economic indicators. The State/discharger should provide any additional information they feel is relevant. This additional information will be critical where the matrix results are not conclusive.

oula, the matrix indicates that they can pay for the new pollution
Thus, a Widespread determination would not be necessary and no
would be given on economic grounds. However, we will do a
ad determination anyway for the practice.

category should proceed to
also expected to be widespread.

DEQ Widespread Criteria - Factors to Consider in Making a Determination of Wide

private) or group of dischargers will have difficulty paying for pollution controls, then an additional analysis must be performed to demonstrate that there will be widespread adverse impacts on the community or surrounding area. There are no economic ratios per se that evaluate socioeconomic impacts. Instead, the relative magnitudes of indicators such as increases in unemployment, losses to the local economy, changes in household income, decreases in tax revenues, indirect effects on other businesses, and increases in sewer fees for remaining private entities should be taken into account when deciding whether impacts could be considered widespread. Since EPA does not have standardized tests and benchmarks with which to measure these impacts, the following guidance is provided as an example of the types of information that should be considered when reviewing impacts on the surrounding community.

pass through to the local economy), consider the baseline economic health of the community, and finally evaluate how the proposed project will affect the socioeconomic well-being of the community. Applicants should feel free to consider additional measures not mentioned here if they judge them to be relevant. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally, rather, their cumulative effect on the community should be assessed.

Answer as many of the following questions as possible and see the additional instructions below:

INPUT CATEGORY	Weight of Importance	
Define the affected study area or community (1)	Most Important	The City of Missoula
Describe the general economic trend in the study area or community--qualitatively or quantitatively. Name the main industry(s) and if any major industries are intending to enter the area or leave the area. What is the current health of that main industry(s)? (2)	Most Important	Tourism, retail, and construction are the fastest growing industries
Indicate the general population trend in the area. Is the community growing or shrinking? Specifically state if young people are staying in the area or leaving after they graduate school (3)	Most Important	Stay in Missoula than in the rest of Montana.
Describe how the economy in general would be affected, if at all, by having to meet requirements. Potential effects, for example, could be changes in median income and/or unemployment. (4)	Most Important	Missoula to affordable cover the new costs
How would the unemployment rate in the study area be affected, if at all, by having to comply with numeric nutrient standards? How would this affect the unemployment rate in comparison to the national average which is 4.7% (Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC) ? (5)	Important	The unemployment
Approximately how many more individuals would become unemployed, if any, as a result of the public entity having to meet numeric nutrient standards? Are there other ample job opportunities to take up the slack (refer to current unemployment rate in Secondary test)? (6)	Important	None

What would be the estimated change in Median Household Income, if any, as a result of having to comply with numeric nutrient standards? Describe qualitatively and/or quantitatively. If any change, how would this affect the Median Household Income in comparison to the state median which is \$37,307 (Source: Susan Ockert, CEIC, extracted from Decision Data Resources)? (7)	Important	The median ho
Percent of households below the poverty line in the affected community and a comparison to the state average of 21.6% (8)	Important	19.6%---about 1
What would be the estimated change in (8) as a result of having to comply with water quality standards and would that change the comparison to the Montana average? The Montana average percent of households below the poverty line is 21.6% or 80,556 homes out of 372,190 (Source: U.S. Census Bureau, 2006 American Community Survey, POVERTY STATUS OF MONTANA HOUSEHOLDS: 2006, Susan Ockert, CEIC) (9)	Important	None because i
Expected increase in social services in affected community, if any, if water quality standards have to be met. This can be answered as a change in dollars, a change in percent from current expenditures, or qualitatively if no data exists. (10)	Important	Very little to no
If applicable, what would be the estimated change in overall net debt of the municipality as a percent of full market value of taxable property as a result of having to meet numeric nutrient standards? (11)	Important	which is still a strong number.
What would be the impact on property values within the affected area, if any, from having to meet numeric nutrient standards? (12)	Important	None
What would be the Impact on community and/or commercial development potential in the study area, if any, from having to meet numeric nutrient standards? (13)	Important	None
Is a large percentage of the wastewater treatment plant used by one or a few entities that would be affected by water quality standards? If yes, and these entities closed down as a result of pollution control costs, would significant burden be placed on the rest of the users of that system? (14)	Important	No
Would expenditures on pollution controls to reach attainment have any positive effects on the community? (15)	Important	quality of water in the Clark Fork.
Would increase levels of water quality have any positive effects on the community? (16) See details of this category next sheet		the main waterway s.

If appropriate, would there be any multiplier effects from cost or benefits as a result of having to meeting numeric nutrient criteria? In other words will a dollar lost or gained as a result of the criteria result in the loss or gain of more than one dollar in the study area (e.g. direct and indirect spending)? (17)

Most important

other goods, but the percentage would be small.

(For non-deg only). In the case of non-degradation, what is the community's majority opinion on growth and/or the entity coming into the town/region and building a facility? What is the community's majority opinion on degradation of the receiving stream's high quality water? (18)

Most Important (non-deg)

Is there any additional information that suggests that there are unique conditions in the affected community that should also be considered? (19)

Important

No

Based on the criteria you just filled out and on your own judgement, will this community experience widespread impacts? Please describe how you reached this decision.

No, this community will not ex

ARRIVING AT A CONCLUSION: The main question to ask is whether widespread economic impacts are likely to occur in the study area as a result of attempting to comply with numeric nutrient standards? (yes/no) The key aspect of a "widespread determination" is that it evaluate change in the socioeconomic conditions that would occur as a result of compliance (EPA 1995).

The analyst should take into account as many of the factors listed above as possible when making a decision on whether impacts are widespread. The decision should be made based on all appropriate factors in a comprehensive manner (rather than as a checklist). The analyst will use his or her judgement on whether all the factors taken together (including some that may not be on this list) constitute widespread impact. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally; rather, their cumulative effect on the community should be assessed as a whole. Applicants should feel free to use anecdotal information to describe any current community characteristics or anticipated impacts that are not listed in the worksheet.

The analyst may want to weight some of these factors more than others. In some cases, the results from a single category might be sufficient to determine whether widespread impacts will occur, even if other factors suggest differently. These categories are weighted by how important they are relative to the general idea "widespread" is attempting to address, although the analyst can use their own weights if supported by evidence.

In most cases, impacts at the state level will be relatively minor. If not, then impacts are, BY DEFAULT, widespread

There may be secondary impacts from having to meet numeric nutrient standards (not captured by the primary and secondary tests to the community). Secondary impacts, for example, might include depressed economic activity in a community resulting from the loss of purchasing power by persons losing their jobs or leaving the area due to increased user fees.

Reductions in employment caused by compliance with the water quality standards could be widespread if workers have no other employment opportunities nearby. Impacts may also be significant where the public entity(ies) is a primary producer of a particular product or service upon which other nearby businesses or the affected community depend. The impacts of reduced business activities or closure will be far greater in this case than if the products are sold elsewhere.

Potentially, one of the most serious impacts on the affected community's economy is the loss of employment caused by a reduction in business activity or closure. Applicants should also consider whether the lack of alternative employment opportunities may lead to an increased need for social services in the affected community.

spread Social and Economic Impacts

ious socioeconomic impacts. If the financial tests outlined in Chapter 2 and 3 suggest that a
s, then an additional analysis must be performed to demonstrate that there will be widespread
evaluate socioeconomic impacts. Instead, the relative magnitudes of indicators such as increases in
nues, indirect effects on other businesses, and increases in sewer fees for remaining private entities
nce EPA does not have standardized tests and benchmarks with which to measure these impacts,
ered when reviewing impacts on the surrounding community.

ct costs pass through to the local economy), consider the baseline economic health of the
of the community. Applicants should feel free to consider additional measures not mentioned here if
In all cases, socioeconomic impacts should not be evaluated incrementally, rather, their cumulative

The City of Missoula wastewater district

Missoula's economy is generally booming, and is not feeling
the larger effects of the current recession. It's economic
output is growing at ___% per year which is higher than the
state average. Tourism, retail, and construction are the
fastest growing industries

The community population is growing fairly rapidly at ___%
per year which is above the Montana population growth rate
average of ___% per year. More young people stay in
Missoula than in the rest of Montana.

The economy would hardly be affected by the higher
wastewater rates. Median income and employment would
not be affected at all. There are enough households in
Missoula to affordable cover the new costs

ent rate would not be affected

The unemployment rate would not be affected

None

usehold income would not be affected.

The median household income would not be affected.

0 percent below state average

19.6%---about 10 percent below state average

ncome would not be affected

None because income would not be affected

ne

Very little to none

The change would be an increase of about 25% from the current 1.55% up to just under 2%, which is still a strong number.

None

None

No

They would expand room for future development and population increase in the area while maintaining the quality of water in the Clark Fork.

It would maintain current water used on the area waterways.

Not enough to be of any concern. Households would have slightly less money to spend on other goods, but the percentage would be small.

—

_____ what if triggering nondeg is a result of just general growth in the c

No
perience widespread impacts.

No, this community will not experience widespread impacts.

ommunity?

Appendix C-Conceptual Measure of Economic Benefits of Clean Water (Optional)

example, in a rural community where the primary source of employment is agriculture, the reduction of fertilizer and pesticide runoff from farms would reduce the cost of treating irrigation water to downstream users. Another example might be an industrial facility discharging its wastewater into a stream that otherwise could be used for recreational cold-water fishing. Treatment or elimination of the industrial wastewater would provide a benefit to recreational fishermen by increasing the variety of fish in the stream. In both cases, the economic benefit is the dollar value associated with the increase in beneficial use or potential use of the waterbody. The types of economic benefits that might be realized will depend on both the characteristics of the polluting entity and characteristics of the affected community, and should be considered on a case by case basis.

to which benefits can be considered in the economic impact analysis. This determination should be coordinated with the EPA Regional Office. A more detailed description of the types of benefits that might be considered is given in Appendix C. This appendix is not intended to provide in-depth guidance on how to estimate economic benefits; rather, it is intended to give States an idea of the types of benefits that might be relevant in a given situation.

between the intrinsic value of the existence of the resource and its value in use by the human population. Use values are further subdivided into direct or indirect uses. Other valuation concepts arise from the uncertainty surrounding future uses and availability of the resource. A classification of these valuation concepts, along with examples, is presented in Table C-1 below.

C.1 Use Benefits

resource and its uses. A waterbody might be used for recreational activities (such as fishing, boating, swimming, hunting, bird watching), for commercial purposes (such as industrial water supply, irrigation, municipal drinking water, and fish harvesting), or for both. Where recreational activities are created or enhanced due to water quality improvements, the public will benefit in the form of increased recreational opportunities. Similarly, the cost of treating irrigation and drinking water to down stream users could be reduced if pollutant discharges were reduced or eliminated in a particular stretch of river.

non-consumptive uses in that the former excludes other uses of the same resource while the latter does not. For example, water is consumed when it is diverted from a waterbody for irrigation purposes. With non-consumptive uses, however, the resource base remains in the same state before and after use (e.g., swimming). Human health benefits associated with cleaner water could be consumptive (reduced illness from eating finfish or shellfish) or non-consumptive (reduced exposure to infectious diseases while recreating).

its use). For example, commercial fisheries have a market value reflected by the financial value of landings of a particular species. By contrast, no market exists to describe the value individuals receive from swimming. Where market values are available, they should be used to estimate benefits. In the case of water supply, there may or may not be a market for clean water. Some water users may be required to pay for that use as in the case of a farmer paying a regional water board to divert water for irrigation purposes. This will be particularly true in the arid west. By contrast, a manufacturing facility using water for cooling or process water may not pay anything for the right to pump and use water from an adjacent river. For resources with no market value, a number of estimation techniques including the travel cost, estimation from similar markets, and contingent valuation methods have been developed.

while they are conceptually distinct attributes, consumptive use is frequently associated with markets and non-consumptive use is frequently associated with non-market situations. Some resources that are considered market resources, however, may be used non-consumptively. The converse is also true. As an example of the first, a fee may be charged (other than parking) to gain entrance to a state park, however, while a swimmer's use of a lake in the park is not consuming any part of the lake.

indirect use. Examples would be a fishing equipment manufacturer's dependence on healthy fish stocks to induce demand for its products or the dependence of property values on the pristine condition of an adjacent water body. Indirect use is also characterized by the scenic views and water enhanced recreational opportunities (camping, picnicking, birdwatching) associated with the quality of water in a water body. Indirect use benefits such as enhanced property values can be estimated using the hedonic price technique. Care should be taken, however, to not double-count benefits. If property values reflect the proximity to and thus use of water, then the value of the use should not be included separately.

C.2 Intrinsic Benefits

the resource. Intrinsic benefits are represented by the sum of existence and option values. Existence value indicates an individual's (and society's) willingness to pay to maintain an ecological resource such as clean water for its own sake, regardless of any perceived or potential opportunity for that individual to use the water body now or in the future. Contributions of money to save endangered species such as the snail darter demonstrate a willingness to pay for the existence of an environmental amenity despite the fact that the contributors may never use it or even experience it directly.

routinely pay to store or transport something they are not sure they will use in the future because they recognize it would be more costly to recreate the item than to preserve it. In an ecological sense, pristine habitats and wildlife refuges are often preserved under the assumption that plant or animal species which may yield pharmaceutical, genetic, or ecosystem benefits are yet to be discovered. Option value takes on particular importance when proposed development or environmental perturbations are largely irreversible or pollutants are persistent. Intrinsic benefits are difficult to measure due to the level of uncertainty associated with these benefits. The most common approach to estimating intrinsic benefits, however, is the contingent valuation method, which cannot be described in detail within this short overview.

C.3 Summary: Summarize the Water Quality Benefits of this pollution control project

Total valuation of clean water benefits includes all use and existence values as well as option value. The proper framework for estimating the economic benefits associated with clean water consists of 1) determining when damage first occurs or would occur; 2) identifying and quantifying the potential physical/biological damages relative to an appropriate baseline; 3) identifying all affected individuals both due to potential loss of direct or indirect services or uses, and to potential losses attributable to existence values (may include projections for growth in participation rates); 4) estimating the value affected individuals place on clean water prior to potential degradation; and 5) determining the time horizon over which the waterbody would be degraded or restored to some maximum reduced state of service (if ever), and appropriately discounting the stream of potential lost services. If evaluating an improvement in water quality, the procedures are the same except that benefits gained are measured.

Table C-1: Categories of Use Benefits

Direct	Indirect	Intrinsic
Consumptive:	Fishing Equipment Manufacturer	Option Value (access to resource in future) Existence Value (knowledge that services of resource exist)
Market Benefits	Property Values	
Industrial Water Supply Agricultural Water Supply Municipal Water Supply	Aesthetics (scenic views, water enhanced recreation)	

Commercial Fishing

Non-Market Benefits

Recreational Fishing

Hunting

Industrial Water Supply

Agricultural Water Supply

Municipal Water Supply

Non-Consumptive:

Swimming

Boating

Human Health

water. For example, in a rural community where the
would reduce the cost of treating irrigation water to
stream that otherwise could be used for recreational
recreational fishermen by increasing the variety of fish
beneficial use or potential use of the waterbody. The
ing entity and characteristics of the affected

the extent to which benefits can be considered in
e. A more detailed description of the types of
depth guidance on how to estimate economic
a given situation.

trade between the intrinsic value of the existence of the
or indirect uses. Other valuation concepts arise from the
concepts, along with examples, is presented in Table C-

of the resource and its uses. A waterbody might be used
purposes (such as industrial water supply, irrigation,
enhanced due to water quality improvements, the public
and drinking water to down stream users could be

ished from non-consumptive uses in that the former
when it is diverted from a waterbody for irrigation
and after use (e.g., swimming). Human health benefits
r non-consumptive (reduced exposure to infectious

s case clean water) can be considered market or non-
mercial fisheries have a market value reflected by the
individuals receive from swimming. Where market values
y not be a market for clean water. Some water users may
r for irrigation purposes. This will be particularly true in the
anything for the right to pump and use water from an
travel cost, estimation from similar markets, and contingent

and non-consumptive use is frequently associated with
l non-consumptively. The converse is also true. As an
ver, while a swimmer's use of a lake in the park is not

fit from indirect use. Examples would be a fishing
e dependence of property values on the pristine condition
l recreational opportunities (camping, picnicking,
nced property values can be estimated using the hedonic
ct the proximity to and thus use of water, then the value of

ent use of the resource. Intrinsic benefits are represented
willingness to pay to maintain an ecological resource such
to use the water body now or in the future. Contributions
the existence of an environmental amenity despite the fact

water in known or as yet unknown ways. In a sense it is a
ing they are not sure they will use in the future because
, pristine habitats and wildlife refuges are often preserved
stem benefits are yet to be discovered. Option value takes
versible or pollutants are persistent. Intrinsic benefits are
approach to estimating intrinsic benefits, however, is the

**value. The proper framework for estimating the
rst occurs or would occur; 2) identifying and
identifying all affected individuals both due to
existence values (may include projections for
water prior to potential degradation; and 5)
me maximum reduced state of service (if ever),
ement in water quality, the procedures are the
d.**

Non-Degradation for a Public Entity

allows the public to make decisions about important environmental actions. Where the State intends to provide for development, it may decide that some lowering of water quality in "high-quality waters" is necessary to accommodate important economic or social development. Any such reduction in water quality, however, must protect existing uses fully and must satisfy the requirements for intergovernmental coordination and public participation.

To determine if water quality can be lowered for a new public development, the same tests are used as in this work

Question:

(1) Will the pollution controls needed to maintain the high-quality water interfere with the proposed public development? (Analogous to secondary test for substantial effects)

(2) Is the proposed public development important economically and socially to the study area? (Analogous to Wide

The tests used to demonstrate interference and importance are the same as those used to demonstrate substantial and widespread. The difference is, however, that an antidegradation review considers situations that would improve the current economic condition.

If the answer is no to either 1 or 2 above, then the analysis is over---no degradation of water quality is necessary. by the pollution controls necessary to prevent degradation *is* an *important* economic and social development.

To answer question (1), please complete Worksheets A through E, and the Substantial Impacts Matrix.

To answer question (2), please complete Worksheet M and the DEQ Widespread Criteria worksheet.

Complete the summary information on tab X.

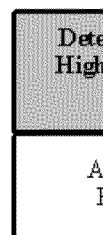
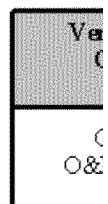
An antidegradation review must determine that the lowering of water quality is necessary in order to accommodate social development in the area in which the waters are located.

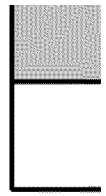
While the terminology is different, the tests to determine substantial and widespread economic impacts (used when removing a use or granting a variance) are basically the same as those used to determine if there might be interference with an important social and economic development (antidegradation). As such, antidegradation analysis is the mirror image of the analyses described in Chapters 2, 3 and 4. Variances and downgrades refer to situations where additional treatment needed to meet standards may result in worsening economic conditions; while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions.

When performing an antidegradation review, the first question is whether the pollution controls needed to maintain the high-quality water will interfere with the proposed development. If not, then the lowering of water quality is not warranted. If, on the other hand, the pollution controls will interfere with development, then the review must show that the development would be an important economic and social one. These two steps rely on the same tests as the determination of substantial and widespread impacts.

The analytic approach presented here can be used for a variety of public-sector and private sector entities, including POTWs, commercial, industrial, residential and recreational land uses, and for point and nonpoint sources of pollution.

Anti





Qu
red
anc

policy that allows the public to make decisions about
side that some lowering of water quality in "high-quality
action in water quality, however, must protect existing
ipation.

sheet. However, the question is slightly different.

d public development? (Analogous to secondary test

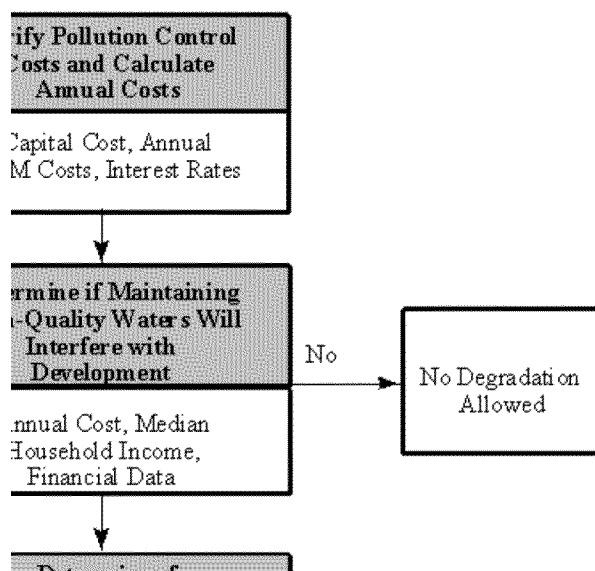
spread Impacts Test)

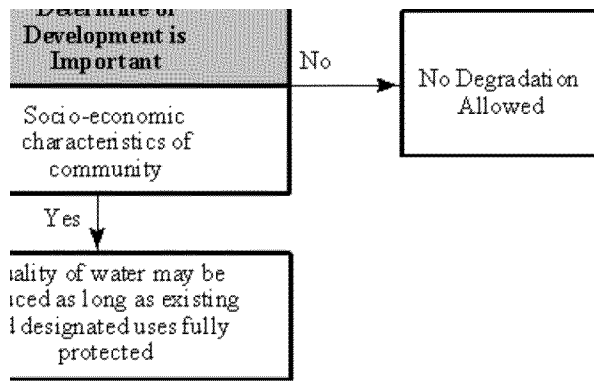
ferred with by the pollution controls necessary to

Matrix.
sheet.

important economic or

Figure 5-1:
degradation Review





Instructions: Review the instructions below for an overview of each step that needs to be taken for the economic analysis of a private facility. Then, start at Worksheet A and work through each of the worksheets until you finish the analysis. For a Non-Degradation analysis, go directly to the last tab. The next tab--the 'Summary Worksheet' tab before Worksheet A--is to be filled out after you work through each worksheet in order to summarize your results.

The analytic approach presented here can be used for a variety of private-sector entities, including commercial, industrial, and recreational land uses, and for point and nonpoint sources of pollution. The guidance provided in this chapter, however, is not meant to be exhaustive. The State and/or EPA may require additional information or tests in order to evaluate whether substantial and widespread impacts will occur.

In addition, the applicant should feel free to include any additional information they feel is relevant. The steps described in further detail in the rest of the chapter are:

Step 1: Verify Project Costs and Calculate the Annual Cost of the Pollution control project

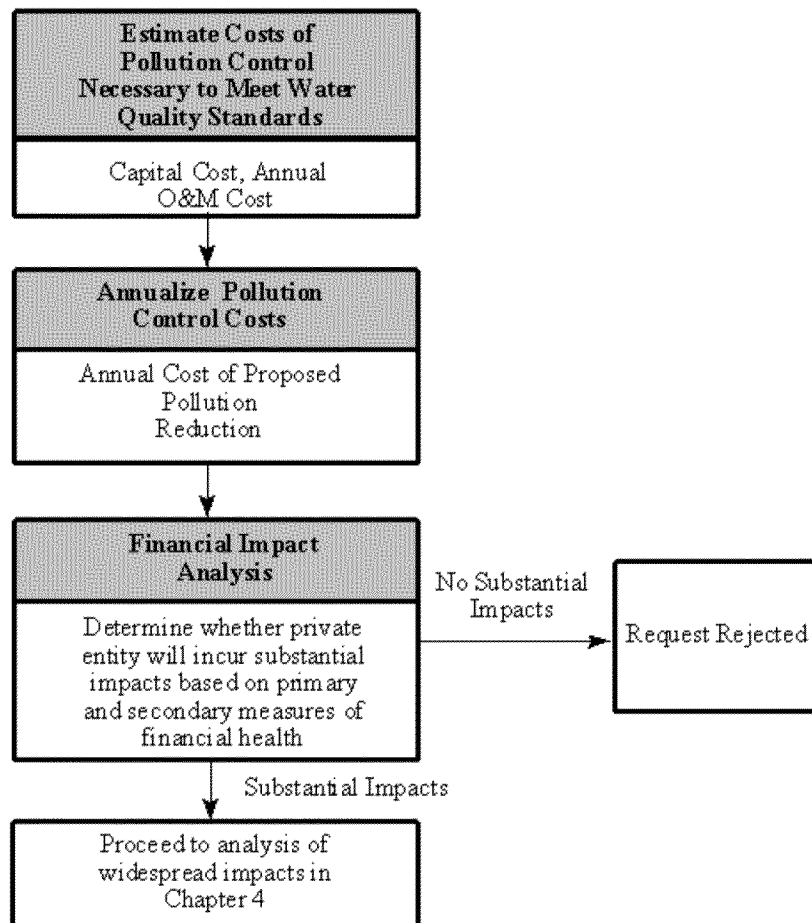
Step 2: Run a Financial Impact Analysis on the Private Entity to assess the extent to which existing or planned activities and/or employment will be reduced as a result of meeting the water quality standards. In other words, will the standards result in substantial impact to the private entity? The primary measure of whether substantial impact will occur is profitability. The secondary measures include indicators of liquidity, solvency, and leverage.

Step 3: If impacts on the private entity are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be **widespread** (Go to "DEQ Widespread Criteria" tab).

o that needs to be taken
A and work through each
analysis, go directly to the
A--is to be filled out after

ustrial, residential

Figure 3-1:
Measuring Substantial Impacts
(Private Entities)



Instructions: Fill out the Summary Worksheet below in order to summarize the results that you reach for each step for your analysis. This is to help give a simple overview of what you found out.

Step 1: Verify Project Costs and Calculate the Annual Cost of the Pollution control project

\$950,000 capital costs/\$188,000 per year

Step 2: Run a Financial Impact Analysis on the Private Entity to assess the extent to which existing or planned activities and/or employment will be reduced as a result of meeting the water quality standards. In other words, will the standards result in substantial impact to the private entity? The primary measure of whether substantial impact will occur is profitability. The secondary measures include indicators of liquidity, solvency, and leverage.

The profit test revealed that profit would be significantly lowered by 5.5%, but would still remain positive. The profit rate would fall to the lower end of the industry average after control costs--the profit rate was about average before control costs. The other three tests indicated that this company could cover the costs of the pollution control. The effect on the private business would likely be significant, but would likely not shut down or curtailed the business in any way.

Step 3: If impacts on the private entity are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be **widespread** (Go to "DEQ Widespread Criteria" tab).

There would be few or no widespread impacts from the business having to pay pollution control costs

Step 4: Present the Final Conclusion

The company can probably afford the pollution control. However, further talks may be necessary with the company to figure out how it might pay for these costs without lowering its profit rate by such a large amount (e.g. can it pass on some costs to customers, can it get more grants, etc.)

s that you reach for each step for your analysis. This is to help give a

Worksheet A--Pollution Control Project Summary Info

The first step in the material impact analysis is an evaluation of the proposed pollution control project. Private entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment. Specific types of pollution prevention activities to be considered include:

- Change in Raw Materials;
- Substitute Process Chemicals;
- Change in Process;
- Water Recycling and Reuse; and
- Pretreatment Requirements.

Whatever the approach, the discharger must demonstrate that the proposed project is the most appropriate means of meeting water quality standards and must document project cost estimates. If at least one of the treatment alternatives that allows the applicant to meet water quality standards would not impose substantial impacts, then they are not able to demonstrate substantial impacts and should not proceed with the analysis presented in the remainder of this workbook.

Since the most cost effective approach to meeting water quality standards should be considered, submissions should list their assumptions about excess capacity, future facility expansion, and alternative technologies. The most accurate estimate of project costs may be available from the discharger's design engineers. These estimates can be compared to estimates available from EPA.

Note: most cost effective project preferred

Please describe the pollution control project being proposed and how the project meets water quality standards:

The project will add an end of pipe treatment (reverse osmosis) to existing water discharge so that Big Spring Creek meets nutrient standards

Please describe the other pollution control options considered, explaining why each option was rejected. Explain how each alternative would have met water quality standards.

This was the cheapest and most effective way to meet nutrient standards. Another option was to connect in with Lewistown's existing system, but the piping costs and type of discharge from the business made that option unpractical and uneconomical.

Is the proposed project the least expensive? If not, give reasons why it is not.

Yes

0011217

Yes

Provide assumptions about excess capacity,
future facility expansion, and alternative
technologies

ect. Private entities should consider a broad range of
es or additions to existing treatment. Specific types of

appropriate means of meeting water quality standards and
applicant to meet water quality standards would not
not proceed with the analysis presented in the remainder

submissions should list their assumptions about excess
object costs may be available from the discharger's design

Worksheet G--Annual Cost of Project

Is there an effective way to meet water quality standards that is affordable to applicant?

If no, calculate total annualized project costs:

Capital Costs to be financed (supplied by the applicant):	(1)	\$950,000
Interest Rate for Financing (expressed as a decimal)	(i)	0.09
Time period of financing (Assume 10 years)	(n)	10
Annualization Factor = $\frac{i}{[(1+i)^n - 1]}$ (or see Appendix B)	(2)	0.15582
Annualized Capital Cost [(1) X (2)]	(3)	\$148,029
Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below and state in terms of dollars per year)	(4)	\$40,000
Total Annual Cost of Pollution Control Project [(3) + (4)]	(5)	\$188,029

Financial Impact Analysis

extent to which existing or planned activities and/or employment will be reduced as a result of meeting water quality standards. Will there be a substantial adverse impact on the applicant as a result of having to meet standards? Will employment or local purchases be lost?

Impact should be looked at.

Primary Measure--Profit: how much will profits decline due to pollution control expenditures?

Secondard Measures--

Liquidity--how easily can an entity pay its short-term bills?

Solvency--how easily can an entity pay its fixed and long-term bills?

Leverage--how much money can the entity borrow?

Profit and solvency ratios are calculated with and without the additional compliance costs (taking into consideration the entity's ability to increase its prices to cover part or all of the costs)

Comparing these ratios to each other and to industry benchmarks provides a measure of the impact on the entity.

For all of the tests, it is important to look beyond the individual test results and evaluate the total situation of the en

The results should be compared with the ratios for other entities in the same industry or activity.

The ratios and tests whould be calculated for several years of operations.

See Chapter 3 in the EPA guidance for more info.

The structure, size, and financial health of the parent firm should also be considered.

An important factor, which may not be reflected in the preceding measures, is the value of an applicant's product or operations to its parent firm. For example, if a facility produces an important input used by other facilities owned by the firm, the firm may be likely to support the facility even if it appears to have only borderline profitability. The results of these tests and other relevant factors, can be used to make a judgement as to the likely actions of the applicant (e.g. shut down entirely, close one or more product/service lines, shift to other products/services, not proceed with an expansion, continue operations at current levels) faced with the pollution control investment.

Each type of test measures a different aspect of a discharger's financial health. The primary measure evaluates the extent to which an applicant's profit rate will change, and compares the profit level to typical profits in that industry. The secondary measures provide additional information about specific impacts that the discharger would bear if required to meet water quality standards. In some cases, the tests might indicate that the discharger would remain profitable (Profit) after investing in pollution control, but would have trouble borrowing the needed capital (Leverage). This situation would indicate a need to work with the discharger in choosing the technology and schedule used to meet the regulations. In other cases the tests might show that the discharger has a short-term problem with meeting the financial obligation imposed by the standards, but could handle it in the long-run (Liquidity vs. Solvency). This is important information when considering whether or not to grant a variance so as to allow more time for compliance.

tity.

Worksheet H--Primary Measure: Profitability

Calculation of Earnings Before Taxes with and without Pollution Control Costs

The Profit Test measures what will happen to the discharger's earnings if additional pollution control is required. If the discharger is making a profit now but would lose money with the pollution control, then the possibility of a total shutdown or the closing of a production line must be considered. Greatly reduced, but still positive, profits are also of concern. Likewise in the case of a proposed facility or proposed expansion; if estimated profits would drop considerably with pollution control, then the development might not take place.

Profit Test = Earnings Before Taxes / Revenues.

This needs to be calculated with and without the cost of pollution control. How much would profit be affected, and what effect would this have on the private entity? What was the discharger's profit rate before pollution control and how did that compare with the industry as a whole or with similar facilities?

Earnings with pollution control costs should be calculated for the latest year with complete financial information. Arguably, as long as the applicant maintains positive earnings, it can afford to pay for the pollution control.

Although complicated, the analysis should consider whether the discharger or firm would be able to raise its prices in order to cover some or all of the pollution control costs. In such a case, revenues increase and earnings fall by an amount less than the costs of pollution control.

A. Earnings Without Pollution Control Project Costs

$$EBT = R - CGS - CO$$

Where:	EBT	=	Earnings Before Taxes	
	R	=	Revenues	
			Cost of Goods Sold (including the cost of materials, direct labor, indirect labor, rent and heat)	
	CGS	=		
			Portion of Corporate Overhead Assigned to the Discharger (selling, general, administrative, interest, R&D expenses, and depreciation on common property)	
	CO	=		If this answer to this question is not applicable, just enter zero'

Three Most Recently Completed Fiscal Years†

	3rd Most Recent	2nd Most recent	Most recent
	2004	2005	2006
R	\$2,450,000	\$2,950,000	\$2,800,000
CGS	\$2,500,000	\$2,550,000	\$2,650,000
CO	\$0	\$0	\$0
EBT [(1) - (2) -(3)]	-\$50,000	\$400,000	\$150,000

Considerations: Have earnings before taxes changed over the three year period? If so, what would a "typical" year be? Yes, they have. Somewhere between the second most and most recent year would be most accurate--probably the most recent year saw record input prices and a recession in the area that slightly lowered revenues

B. Earnings With Pollution Control Project Costs

$$\text{EWPR} = \text{EBT} - \text{ACPR}$$

Where: EWPR = Earnings with Pollution Control Project Costs
 EBT = Earnings Before Taxes (4)
 ACPR = Total Annual Costs of Pollution Control Project [Worksheet G, (5)]

20__^{*}
 EBT (4) \$ 250,000(5)
 ACPR \$ 188,029
 [Worksheet G, (5)]
 (6)
 EWPR [\$ 61,971
 (5) - (6)] (7)

[†] For new businesses with no earnings records, provide the projected earnings from the business plan.

^{*} The most recently completed fiscal year

Considerations: Is the discharger expected to have positive earnings after paying the annual cost of pollution control?

hat

tion is not applicable, just enter
zero'

- (1)
- (2)
- (3)
- (4)

ear's EBT be? Please explain below.
robably \$250,000 per year.

.

ontrol? ☒ Yes ☐ No

Calculation of Profit Rates

With and Without Pollution Control Project Costs

A. Profit Rate Without Project Costs

$$PRT = EBT \div R$$

Where:	PRT	=	Profit Rate Before Taxes
	EBT	=	Earnings Before Taxes
	R	=	Revenues

Three Most Recently Completed Fiscal Years

	2004	2005	2006	
EBT [Worksheet H, (4)]	-50000	400000	150000	(1)
R [Worksheet H, (1)]	2450000	2950000	2800000	(2)
PRT = Profit Rate Calculate: before [(1)/(2)] project	-2.04%	13.56%	5.36%	(3)

Considerations: How have profit rates changed over the three years?

Is the most recent year typical of the three years? Yes/No (If not, you might want to use an earlier year or years for the analysis)

___No--we should use an average of the two most recent years--\$250,000 or about 9%

How do these profit rates compare with the profit rates for this line of business"? Please discuss

Profit rates in this business vary widely from breaking even to 20%. It depends on how the economy is doing. 10% or less is a good average.

B. Profit Rate With Pollution Control Costs

$$PRPR = EWPR \div R$$

Where:	PRPR	=	Profit Rate With Pollution Control Costs
			Before- Tax Earnings With Pollution Control Costs
	EWPR	=	
	R	=	Revenues

**The Most
Recently
Completed
Fiscal Year**

	20__	
EWPR	\$61,971	
[Worksheet H, (7)]		(4)
R	\$2,800,000	
[Worksheet H, (1)]		(5)
PRPR	2.21%	
[Calculate : (4)/(5)]		(6)

Profit rate after project

Considerations:

What is the percentage change in the profit rate due to pollution control costs ? Calculate as follows: (PRPR - PR)/

How does the profit rate with pollution control compare to the profit rate of this line of business?

Does the firm's profit remain positive, if it was already positive?

PR x 100 About 7%

Before control cost--about average, after
control costs, towards the lower end

Yes, it does

Worksheet J--Secondary Test: Liquidity

Calculation of The Current Ratio

Liquidity is a measure of how easily a discharger can pay its short-term bills.

One measure of liquidity is the Current Ratio, which compares current assets with current liabilities. Current assets include cash and other assets that are or could reasonably be converted into cash during the current year.

Calculation of The Current Ratio

$$CR = CA \div CL$$

Where: CR = Current Ratio

CA = Current Assets (the sum of inventories, prepaid expenses, and accounts receivable)

CL = Current Liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)

Three Most Recently Completed Fiscal Years

	3rd Most Recent	2nd Most recent	Most recent
	2004	2005	2006
CA	\$3,100,000	\$4,300,000	\$4,500,000 (1)
CL	\$2,100,000	\$1,800,000	\$1,600,000 (2)
CR	1.48	2.39	2.81 (3)
[Calculate : (1)/(2)]			

Considerations: This company is slowly pa

Is the most recent year typical of the three years? ☐ Yes ☐ No No--the current ratio is go

(If not, you might want to use an earlier year or years for the analysis)

Is the Current Ratio (3) greater than 2.0? ☐ Yes ☐ No Yes, and rising.

How does the Current Ratio (3) compare with the Current Ratios for other firms in this line of business? Favorably. This firm should

The general rule is that if the Current Ratio is greater than 2, the entity should be able to cover its short-term obligations. Frequently, lenders require this level of liquidity as a prerequisite for lending.

In addition, this rule (Current Ratio > 2) may not be appropriate for all types of private entities covered by Water Quality Standards. The Current Ratio of the discharger in question should be compared with ratios for other dischargers in the same line of business.

If the discharger's ratio compares favorably with the median or upper quartile ratio for similar businesses, it should be able to cover its short term obligations.

ying off its debt and gaining inventory

ing up over time

ld be able to cover its short term obligations.

Worksheet K-Secondary Test: Solvency

Calculation of Beaver's Ratio

Solvency is a measure of an entity's ability to meet its fixed and long-term obligations. These obligations are bills and debts that are owed on a regular basis for periods longer than one year. Solvency tests are commonly used to predict financial problems that could lead to bankruptcy within the next few years.

Since any single year of data can easily be distorted by unusually high or low net income or by the timing of debt, solvency tests must be considered over at least three years of data in order to reveal long-term trends.

One commonly used solvency test (called Times Interest Earned) compares income before interest and taxes to interest expenses. Another solvency test, the Beaver's Ratio, compares cash flow to total debt. This test has been shown to be a good indicator of the likelihood of bankruptcy.

Worksheet K

Calculation of Beaver's Ratio

$$BR = CF \div TD$$

Where: BR = Beaver's Ratio
 CF = Cash Flow the cash the entity has available to it in a given year
 TD = Total Debt debt for the current year plus the long term debt

	3rd Most Recent 2004	2nd Most recent 2005	Most recent 2006	
Cash Flow:				
Net Income After Taxes	320000	540000	620000	(1)
Depreciation	30000	40000	50000	(2)
CF	350000	580000	670000	(3)
[Calculate: (1) + (2)]				
Total Debt:				
Current Debt \$	_____	\$ _____	\$ _____	(4)
Long-Term Debt \$	_____	\$ _____	\$ _____	(5)
Total Debt	1500000	1300000	1400000	(6)
Beaver's Ratio:				

BR [(3)/(6)] 0.23 0.45 0.48 (7)

Considerations:

Is the most recent year typical of the three years? __ Yes __ No Yes

(If not, you might want to use an earlier year or years for the analysis)

Is the Beaver's Ratio for this discharger greater than 0.2? __ Yes __ No Yes Solvent

Is the Beaver's Ratio for this discharger less than 0.15? __ Yes __ No Bankruptcy is po

Is the Beaver's Ratio for this discharger between 0.2 and 0.15? __ Yes __ No Gray area

If possible, run the Beaver's Ratio again with pollution control costs and compare the two

How does this ratio compare with the Beaver's Ratio for other firms in the same business?

The discharger's Beaver's Ratio should be compared with the ratios of similar dischargers.

ears.

ssible

It goes down to about 0.29--still solvent

Above average

Worksheet L: Secondary Test: Leverage

Debt to Equity Ratio

Leverage tests measure the extent to which a firm already has fixed financial obligations and thus indicate how much. Most leverage tests compare equity to some measure of debt or fixed assets.

The Debt to Equity Ratio is the most commonly used method of measuring leverage.

The debt to equity ratio must be calculated for the entire firm. The ratio measures how much the firm has borrowed the amount of capital which is owned by its stockholders (equity).

The Debt to Equity Ratio is equal to Long-Term Liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities like deferred income taxes) divided by Owners' Equity. Owner's Equity is the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings. For publicly held firms, use Net Stockholders Equity (which is the equivalent of Total Stockholder Equity minus any Treasury Stock).

Since there are no generally accepted Debt/Equity Ratio values that apply to all types of economic activity, the ratio should be compared with the ratio of firms in similar businesses. If the entity's ratio compares favorably with the median or upper quartile ratio for similar businesses, it should be able to borrow additional funds.

This ratio is not appropriate for entities with special sources of funding such as Agriculture and affordable housing. the probability that the project will receive money for meeting standards.

Debt to Equity Ratio

$$\text{DER} = \text{LTL} \div \text{OE}$$

Where:	DER	=	Debt/Equity Ratio
			Long-Term Liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)
	LTL	=	Owner Equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)
	OE	=	

Three Most Recently Completed Fiscal Years

	3rd Most Recent	2nd Most recent	Most recent	
	2004	2005	2006	
LTL	1,800,000	1,600,000	1,600,000	(1)
OE	900,000	2,000,000	2,200,000	(2)

DER	2.00	0.80	0.73	(3)
[(1)/(2)]				

Considerations:

Is the most recent year typical of the three years? ☐ Yes ☐ No No, but typica

(If not, you might want to use an earlier year or years for the analysis) _____

How does the Debt to Equity Ratio compare with the ratio for firms in the same business? It is just below

ch money a firm is capable of borrowing

(debt) relative to

In those cases, the measure is

I of current trend

average

Substantial Impacts Determination

Total Annual Cost of Pollution Control Project [(3) + (4)]

The purpose of the financial impact analysis is to assess the extent to which existing or planned activities and/or employment will be reduced as a result of meeting water quality standards. Will there be a substantial adverse impact on the applicant as a result of having to meet standards? Will employment or local purchases be lost?

be substantial, then a Widespread Impact should be looked at.

Primary Measure--Profit: how much will profits decline due to pollution control expenditures?

Secondard Measures--

Liquidity--how easily can an entity pay i
Solvency--how easily can an entity pay
Leverage--how much money can the en

Result:

Profit Test

Profit Rate before pollution costs

0.09

Profit Rate after pollution costs

0.035

What is the percentage change in the profit rate due to pollution control costs ? Calculate as follows: $(PRPR - PR)/PR \times 100$

5.50%

How does the profit rate with pollution control compare to the profit rate of this line of business?

Below average

Conclusion: Is this value substantially influenced by having to pay pollution control costs?

Yes

Will the change in this value as a result of pollution control costs reduce planned activities for the discharger and result in substantially less economic acitivity such as employment?

Some costs on
to consumers.
We may need
more analysis.

Are the impacts from having to meet pollution controls substantial?

complete the
next step and
do a
Widespread
analysis

Things to Consider:

If the discharger is making a profit now but would lose money with the pollution control, then the possibility of a total shutdown or the closing of a production line must be considered. Likewise in the case of a proposed facility; if it would make money without the pollution control but would make much less or even lose money with it, then the development might not take place. In either case, there is the

chance that employment will be lost and local purchases by the discharger reduced. Whether or not these impacts will be considered widespread is addressed in Chapter 4.

Another possible scenario is that the discharger may shift to an alternative economic activity (e.g., manufacture another product or produce a different crop). While the applicant will not have gone out of business, this shift may result in reduced profits, employment, and purchases in the local community that must be considered. In each case, it is important to take the entire picture presented by the four ratios into account in judging whether or not the discharger will incur substantial impacts due to the cost of the necessary pollution reductions.

Using the guidance presented in this chapter, applicants that feel they have demonstrated substantial impacts should proceed to Chapter 4: Determination of Widespread Impacts. If dischargers are not able to demonstrate substantial impacts, the entity must meet existing standards. If a group of dischargers within the community will experience the substantial impacts resulting from compliance with water quality standards, these impacts should be considered jointly when assessing whether or not the impacts will be widespread.

sting or planned activities and/or employment will be
ial adverse impact on the applicant as a result of having

is found to be substantial, then a Widespread Impact should be looked at.

ts short-term bills?
its fixed and long-term bills?
tity borrow?

Liquidity Test

What is the Current ratio?	2.81
Is the Current Ratio (3) greater than 2.0?	Yes
How does the Current Ratio (3) compare with the Current Ratios for other firms in this line of business?	Above average
	No

Solvency Test

What is the Beaver's ratio?	0.48
How does this ratio compare with the Beaver's Ratio for other firms in the same business?	Above ave
	Somewhat but not harmful

hard to say. Likely, it will not result in less economic activity overall, since the company is doing well.
The company may be able to pass some costs on to consumers. We may need more analysis.

While there is no definitive answer, the analyst would lean towards No Substantial impact. The analyst will complete the next step and do a Widespread analysis

\$ _____(5)

Leverage Test

What is the Debt to Equity Ratio? 0.73

How does the Debt to Equity Ratio compare with the ratio for firms in the same business? Below average or pretty good

Somewhat but not harmful

Factors to Consider in Making a Determination of Widespread Social and Economic Interdependence

between the affected entity(ies) and the affected community is a major factor in demonstrating that the impacts are not only substantial, but also widespread.

Answer as many of the following questions as possible and see additional instructions below:

INPUT CATEGORY	Weight of Importance	
Define the affected study area or community (1)	Most Important	Lewistown is a moderate sized city.
Describe the general economic trend in the study area or community-- qualitatively or quantitatively. Name the main industry(s) and if any major industries are intending to enter the area or leave the area. What is the current health of that main industry(s)? (2)	Most Important	supplies, manufacturing, retail and tourism
Indicate the general population trend in the area. Is the community growing or shrinking? Specifically state if young people are staying in the area or leaving after they graduate school (3)	Most Important	right at the Montana average
What is the role of the effected private entity in the community? For example, how big of an employer is the affected entity in the study area, and are there other industries to cushion any adverse effects that may result if that entity is hurt in any way? (4)	Most Important	y about the economic picture of Lewistown
What is the tax revenue paid by the private entity as a percentage of the affected community's total tax revenue? (5)	Important	collected annually.
Is the entity a primary producer of a particular product or service upon which other nearby businesses or the affected community depend? (6)	Important	product for other businesses in town.
For a private entity, what is the chance that having to meet water quality standards would close down that entity (see the secondary tests for the private entity)? What is the general trend in this industry at this time (would this business have closed down anyway)? (7)	Most Important	water trends and the general economy
Describe how the economy in general would be affected, if at all, by the private entity having to meet requirements. Potential effects, for example, could be changes in median income and/or unemployment. (8)	Most Important	business had to cut back its operations
Is the unemployment rate of the affected study area more than 1% above the national average, within 1% of national average, or more than 1% below national average? (9)	Data	national average, which is good.

How would the unemployment rate in the study area be affected, if at all, by having to comply with numeric nutrient standards? How would this affect the unemployment rate in comparison to the national average which is 4.7% (Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC) ? (10)	Very Important	Lewistown would still remain at 1% below the national average
Approximately how many more individuals would become unemployed, if any, as a result of having to meet numeric nutrient standards? How does this compare to total jobs in the study area? Are there other ample job opportunities to take up the slack (refer to current unemployment rate in Secondary test)? (11)	Important	likely other jobs in Lewistown that could be had.
Is Median Household income more than 10% below the state median, within 10% of the state median or more than 10% above the state median? See "Secondary Indicators" tab. (12)	Data	10% below the state median
any, as a result of having to comply with numeric nutrient standards: Describe qualitatively and/or quantitatively. If any change, how would this affect the Median Household Income in comparison to the state median which is \$37,307 (Source: Susan Ockert, CEIC, extracted from Decision Data Resources)? (13)	Data	Almost none.
What would be the estimate total loss in household income as a result of the private entity having to meet pollution standards? (14)	Important	the town level.
Percent of households below the poverty line in the affected community and a comparison to the state average-21.6% (15)	Important	the state average.
comply with water quality standards and would that change the comparison to the Montana average? The Montana average percent of households below the poverty line is 21.6% or 80,556 homes out of 372,190 (Source: U.S. Census Bureau, 2006 American Community Survey, POVERTY STATUS OF MONTANA HOUSEHOLDS: 2006, Susan Ockert, CEIC) (16)	Important	Nothing
Expected increase in social services needed in affected community, if any, if water quality standards have to be met. This can be answered as a change in dollars, a change in percent from current expenditures, or qualitatively if no data exists. (17)	Important	Little to none
Would private entities closing or becoming smaller as a result of water quality standards result in a greater than 1% drop in property tax revenues in the study area? (19)	Important	possibly 0.8% of all property taxes.
What would be the impact on property values within the affected area, if any, from having to meet numeric nutrient standards? (20)	Important	No Impact
What would be the Impact on commercial development potential in the study area, if any, from having to meet numeric nutrient standards? Would other businesses choose not to located in the effected area in the future as a result of meeting water quality standards? (21)	Important	Probably no effect

Is a large percentage of the wastewater treatment plant used by one or a few entities that would be affected by water quality standards? If yes, and these entities closed down or ramped down business, would significant burden be placed on the rest of the users of that system? (22)

Important

No.

Would expenditures on pollution controls to reach attainment have any positive effects on the community? (23)

Important

water
quality

Would increase levels of water quality have any positive effects on the community? (24)

Important

existing
uses.

If appropriate, would there be any multiplier effects from cost or benefits as a result of having to meeting numeric nutrient criteria? In other words will a dollar lost or gained as a result of the criteria result in the loss or gain of more than one dollar in the study area (e.g. direct and indirect spending)? (25)

Most important

is not
directly
connected
with other
businesses
in town

(For non-deg only). In the case of non-degradation, what is the community's majority opinion on growth and/or the entity coming into the town/region and building a facility? What is the community's majority opinion on degradation of the receiving stream's high quality water? (26)

Most important

—

Is there any additional information that suggests that there are unique conditions in the affected community that should also be considered? (27)

Important

—

Based on the criteria you just filled out and on your own judgement, will this community experience widespread impacts? Please describe how you reached this decision.

costs,
even if the
business
has to cut
back
operations

CONCLUSION: The main question to ask is whether widespread economic impacts are likely to occur in the study area as a result of attempting to comply with numeric nutrient standards? (yes/no) The key aspect of widespread is that it evaluate change in the socioeconomic conditions that would occur as a result of compliance (EPA 2005).

The analyst should take into account as many of the factors listed above as possible when making a decision on whether impacts are widespread. The decision should be made based on all appropriate factors in a comprehensive manner (rather than as a checklist). The analyst will use his or her judgement on whether all the factors taken together (including some that may not be on this list) constitute widespread impact. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally; rather, their cumulative effect on the community should be assessed as a whole. Applicants should feel free to use anecdotal information to describe any current community characteristics or anticipated impacts that are not listed in the worksheet.

The analyst may want to weight some of these factors more than others. In some cases, the results from a single category might be sufficient to determine whether widespread impacts will occur, even if other factors suggest differently. These categories are weighted by how important they are relative to the general idea "widespread" is attempting to address, although the analyst can use their own weights if supported by evidence.

"widespread" is attempting to address, although the analyst can use their own weights if supported by evidence.

In the case of a private entity, the current economic condition of the affected community and the role of the affect entity(s) within the community should be considered when determining whether the affected community will be able to absorb the impacts of reduced business activity or closures. Through property taxes and employment, the entity(ies) may be a key contributor to the economic base of the affected community.

In most cases, impacts at the state level will be relatively minor. If not, then impacts are widespread

There may be secondary impacts from having to meet numeric nutrient standards (not captured by the primary and secondary tests to the community). Secondary impacts, for example, might include depressed economic activity in a community resulting from the loss of purchasing power by persons losing their jobs due to increased user fees.

Reductions in employment caused by compliance with the water quality standards could be widespread if workers have no other employment opportunities nearby. Impacts may also be significant where the entity(ies) is a primary producer of a particular product or service upon which other nearby businesses or the affected community depend. The impacts of reduced business activities or closure will be far greater in this case than if the products are sold elsewhere.

Potentially, one of the most serious impacts on the affected community's economy is the loss of employment caused by a reduction in business activity or closure. Applicants should also consider whether the lack of alternative employment opportunities may lead to an increased need for social services in the affected community.

ic Impacts

The town of Lewiston, not including the outlying areas that are not on the wastewater system. Lewiston is a moderate sized city.

The economy is holding steady with economic growth that is in line with historical growth rates and slightly lower than national growth. The largest industries are ag supplies, manufacturing, retail and tourism

The population is growing slightly right at the Montana average

It employs 75 people which is almost 2% of total employment. While a major employer, it is not a large enough employer to significantly affect the economic picture of Lewistown

It is 0.8% or a very small amount of the \$1.15 million collected annually.

It is the only tanning company in town, although tanning is not a major product for other businesses in town.

There is little chance that this would close down the entity. Tanning in general is a cyclical industry that rises and falls with trends and the general economy

There would probably be very little effect on the economy in Lewistown, even if this business had to cut back its operations.

It is more than 1% below the national average, which is good.

It would be affected very little, if at all. Lewistown would still remain at 1% below the national average

Probably very few---at the most 10 workers although probably the answer is closer to zero. There are likely other jobs in Lewistown that could be had.

More than 10% below the state median

Almost none.

Probably almost none on the town level.

14.6% well below the state average.

Nothing

Little to none

No. The whole company pays only 0.8% of all property taxes.

No Impact

Probably no effect

No.

They would protect the fishery in Big Spring Creek and help maintain water quality

It would help fish quality and protect existing uses.

Probably very few, because the tanning business would likely not have to slow down, and is not directly connected with other businesses in town

_____ what if triggering nondeg is a result of just general growth in the comm

This community will likely not experience widespread impacts as a result of the new pollution control costs, even if the business has to cut back operations

unity?

Appendix C-Conceptual Measure of Economic Benefits of Clean Water (Optional)

example, in a rural community where the primary source of employment is agriculture, the reduction of fertilizer and pesticide runoff from farms would reduce the cost of treating irrigation water to downstream users. Another example might be an industrial facility discharging its wastewater into a stream that otherwise could be used for recreational cold-water fishing. Treatment or elimination of the industrial wastewater would provide a benefit to recreational fishermen by increasing the variety of fish in the stream. In both cases, the economic benefit is the dollar value associated with the increase in beneficial use or potential use of the waterbody. The types of economic benefits that might be realized will depend on both the characteristics of the polluting entity and characteristics of the affected community, and should be considered on a case by case basis.

to which benefits can be considered in the economic impact analysis. This determination should be coordinated with the EPA Regional Office. A more detailed description of the types of benefits that might be considered is given in Appendix C. This appendix is not intended to provide in-depth guidance on how to estimate economic benefits; rather, it is intended to give States an idea of the types of benefits that might be relevant in a given situation.

between the intrinsic value of the existence of the resource and its value in use by the human population. Use values are further subdivided into direct or indirect uses. Other valuation concepts arise from the uncertainty surrounding future uses and availability of the resource. A classification of these valuation concepts, along with examples, is presented in Table C-1 below.

C.1 Use Benefits

resource and its uses. A waterbody might be used for recreational activities (such as fishing, boating, swimming, hunting, bird watching), for commercial purposes (such as industrial water supply, irrigation, municipal drinking water, and fish harvesting), or for both. Where recreational activities are created or enhanced due to water quality improvements, the public will benefit in the form of increased recreational opportunities. Similarly, the cost of treating irrigation and drinking water to down stream users could be reduced if pollutant discharges were reduced or eliminated in a particular stretch of river.

non-consumptive uses in that the former excludes other uses of the same resource while the latter does not. For example, water is consumed when it is diverted from a waterbody for irrigation purposes. With non-consumptive uses, however, the resource base remains in the same state before and after use (e.g., swimming). Human health benefits associated with cleaner water could be consumptive (reduced illness from eating finfish or shellfish) or non-consumptive (reduced exposure to infectious diseases while recreating).

its use). For example, commercial fisheries have a market value reflected by the financial value of landings of a particular species. By contrast, no market exists to describe the value individuals receive from swimming. Where market values are available, they should be used to estimate benefits. In the case of water supply, there may or may not be a market for clean water. Some water users may be required to pay for that use as in the case of a farmer paying a regional water board to divert water for irrigation purposes. This will be particularly true in the arid west. By contrast, a manufacturing facility using water for cooling or process water may not pay anything for the right to pump and use water from an adjacent river. For resources with no market value, a number of estimation techniques including the travel cost, estimation from similar markets, and contingent valuation methods have been developed.

while they are conceptually distinct attributes, consumptive use is frequently associated with markets and non-consumptive use is frequently associated with non-market situations. Some resources that are considered market resources, however, may be used non-consumptively. The converse is also true. As an example of the first, a fee may be charged (other than parking) to gain entrance to a state park, however, while a swimmer's use of a lake in the park is not consuming any part of the lake.

indirect use. Examples would be a fishing equipment manufacturer's dependence on healthy fish stocks to induce demand for its products or the dependence of property values on the pristine condition of an adjacent water body. Indirect use is also characterized by the scenic views and water enhanced recreational opportunities (camping, picnicking, birdwatching) associated with the quality of water in a water body. Indirect use benefits such as enhanced property values can be estimated using the hedonic price technique. Care should be taken, however, to not double-count benefits. If property values reflect the proximity to and thus use of water, then the value of the use should not be included separately.

C.2 Intrinsic Benefits

the resource. Intrinsic benefits are represented by the sum of existence and option values. Existence value indicates an individual's (and society's) willingness to pay to maintain an ecological resource such as clean water for its own sake, regardless of any perceived or potential opportunity for that individual to use the water body now or in the future. Contributions of money to save endangered species such as the snail darter demonstrate a willingness to pay for the existence of an environmental amenity despite the fact that the contributors may never use it or even experience it directly.

routinely pay to store or transport something they are not sure they will use in the future because they recognize it would be more costly to recreate the item than to preserve it. In an ecological sense, pristine habitats and wildlife refuges are often preserved under the assumption that plant or animal species which may yield pharmaceutical, genetic, or ecosystem benefits are yet to be discovered. Option value takes on particular importance when proposed development or environmental perturbations are largely irreversible or pollutants are persistent. Intrinsic benefits are difficult to measure due to the level of uncertainty associated with these benefits. The most common approach to estimating intrinsic benefits, however, is the contingent valuation method, which cannot be described in detail within this short overview.

C.3 Summary: Summarize the Water Quality Benefits of this pollution control project

Total valuation of clean water benefits includes all use and existence values as well as option value. The proper framework for estimating the economic benefits associated with clean water consists of 1) determining when damage first occurs or would occur; 2) identifying and quantifying the potential physical/biological damages relative to an appropriate baseline; 3) identifying all affected individuals both due to potential loss of direct or indirect services or uses, and to potential losses attributable to existence values (may include projections for growth in participation rates); 4) estimating the value affected individuals place on clean water prior to potential degradation; and 5) determining the time horizon over which the waterbody would be degraded or restored to some maximum reduced state of service (if ever), and appropriately discounting the stream of potential lost services. If evaluating an improvement in water quality, the procedures are the same except that benefits gained are measured.

Table C-1: Categories of Use Benefits

Direct	Indirect	Intrinsic
Consumptive:	Fishing Equipment Manufacturer	Option Value (access to resource in future) Existence Value (knowledge that services of resource exist)
Market Benefits	Property Values	
Industrial Water Supply Agricultural Water Supply Municipal Water Supply	Aesthetics (scenic views, water enhanced recreation)	

Commercial Fishing

Non-Market Benefits

Recreational Fishing

Hunting

Industrial Water Supply

Agricultural Water Supply

Municipal Water Supply

Non-Consumptive:

Swimming

Boating

Human Health

water. For example, in a rural community where the
would reduce the cost of treating irrigation water to
stream that otherwise could be used for recreational
recreational fishermen by increasing the variety of fish
beneficial use or potential use of the waterbody. The
ing entity and characteristics of the affected

the extent to which benefits can be considered in
e. A more detailed description of the types of
depth guidance on how to estimate economic
a given situation.

trade between the intrinsic value of the existence of the
or indirect uses. Other valuation concepts arise from the
concepts, along with examples, is presented in Table C-

of the resource and its uses. A waterbody might be used
purposes (such as industrial water supply, irrigation,
enhanced due to water quality improvements, the public
and drinking water to down stream users could be

ished from non-consumptive uses in that the former
when it is diverted from a waterbody for irrigation
and after use (e.g., swimming). Human health benefits
r non-consumptive (reduced exposure to infectious

s case clean water) can be considered market or non-
mercial fisheries have a market value reflected by the
individuals receive from swimming. Where market values
y not be a market for clean water. Some water users may
r for irrigation purposes. This will be particularly true in the
anything for the right to pump and use water from an
travel cost, estimation from similar markets, and contingent

and non-consumptive use is frequently associated with
l non-consumptively. The converse is also true. As an
ver, while a swimmer's use of a lake in the park is not

fit from indirect use. Examples would be a fishing
e dependence of property values on the pristine condition
l recreational opportunities (camping, picnicking,
nced property values can be estimated using the hedonic
ct the proximity to and thus use of water, then the value of

ent use of the resource. Intrinsic benefits are represented
willingness to pay to maintain an ecological resource such
to use the water body now or in the future. Contributions
the existence of an environmental amenity despite the fact

water in known or as yet unknown ways. In a sense it is a
ing they are not sure they will use in the future because
, pristine habitats and wildlife refuges are often preserved
stem benefits are yet to be discovered. Option value takes
versible or pollutants are persistent. Intrinsic benefits are
approach to estimating intrinsic benefits, however, is the

The proper framework for estimating the economic
occur; 2) identifying and quantifying the potential
als both due to potential loss of direct or indirect
or growth in participation rates); 4) estimating the
e time horizon over which the waterbody would be
counting the stream of potential lost services. If
at benefits gained are measured.

Non-Degradation for a Private Entity

allows the public to make decisions about important environmental actions. Where the State intends to provide for development, it may decide that some lowering of water quality in "high-quality waters" is necessary to accommodate important economic or social development. Any such reduction in water quality, however, must protect existing uses fully and must satisfy the requirements for intergovernmental coordination and public participation.

To determine if water quality can be lowered for a new private development, the same tests are used as in this wor

Question:

- (1) Will the pollution controls needed to maintain the high-quality water interfere substantially with the proposed private development? (Analogous to secondary test for substantial effects)
- (2) Is the proposed private development important economically and socially to the study area? (Analogous to Wid

The tests used to demonstrate interference and importance are the same as those used to demonstrate substantial and widespread. The difference is, however, that an antidegradation review considers situations that would improve the current economic condition.

If the answer is no to either 1 or 2 above, then the analysis is over---no degradation of water quality is necessary. by the pollution controls necessary to prevent degradation *is* an *important* economic and social development.

worksheet.

To answer question (2), please complete the DEQ Widespread Criteria worksheet.

Please fill out the Nondeg summary sheet

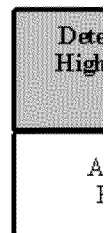
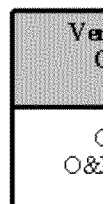
An antidegradation review must determine that the lowering of water quality is necessary in order to accommodate social development in the area in which the waters are located.

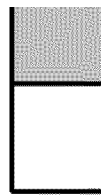
While the terminology is different, the tests to determine substantial and widespread economic impacts (used when removing a use or granting a variance) are basically the same as those used to determine if there might be interference with an important social and economic development (antidegradation). As such, antidegradation analysis is the mirror image of the analyses described in Chapters 2, 3 and 4. Variances and downgrades refer to situations where additional treatment needed to meet standards may result in worsening economic conditions; while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions.

When performing an antidegradation review, the first question is whether the pollution controls needed to maintain the high-quality water will interfere with the proposed development. If not, then the lowering of water quality is not warranted. If, on the other hand, the pollution controls will interfere with development, then the review must show that the development would be an important economic and social one. These two steps rely on the same tests as the determination of substantial and widespread impacts.

The analytic approach presented here can be used for a variety of public-sector and privatesector entities, including POTWs, commercial, industrial, residential and recreational land uses, and for point and nonpoint sources of pollution.

Anti





Qu
red
anc

policy that allows the public to make decisions about
side that some lowering of water quality in "high-quality
action in water quality, however, must protect existing
ipation.

ksheet. However, the question is slightly different.

n the proposed private development? (Analogous to

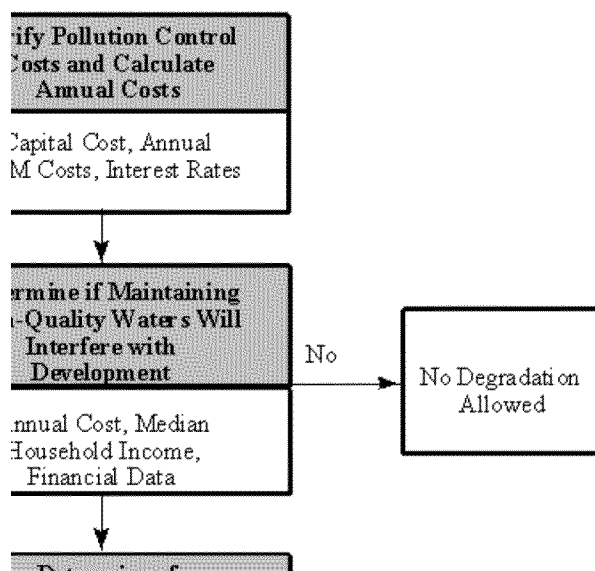
espread Impacts Test)

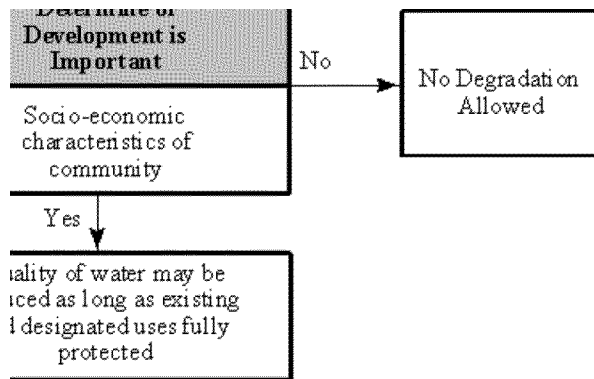
erfered with by the pollution controls necessary to

Determined worksheet.

important economic or

**Figure 5-1:
degradation Review**





the results that you reach for each step for your analysis. This is help to give a simple overview of what you found out.

OVERALL STEPS SUMMARY

Step 1: Apply the Primary Test - Will the Annual Cost of the Pollution control project

Step 2: Apply the Secondary Test - Will the pollution controls needed to maintain the high-quality water interfere with the proposed private development in a way that compromises the private entity's financial well-being? If not, then they can afford the necessary water treatment.

Step 3: If impacts are expected to be substantial on the private entity, then the applicant goes on to demonstrate that the private entity contributes to economic development that is important economically and socially to the study area. (Analagous to Widespread Impacts Test)

summarize the results that you reach for
and out.

Instructions: Review the instructions below for an overview of each step that needs to be taken for the economic analysis of a public facility. Then, start at Worksheet A and work through each of the worksheets until you finish the analysis. For a Non-Degradation analysis, go directly to the last tab. The next tab--the 'Summary Worksheet' tab before Worksheet A--is to be filled out after you work through each worksheet in order to summarize your results.

Summarized below are the steps that need to be taken for the economic analysis of a public facility. Also provided to the right is a flowchart that summarizes those same steps. The complete EPA Guidance for Water Quality Standards can be found at <http://www.epa.gov/waterscience/standards/econworkbook/>

OVERALL STEPS SUMMARY

NOTES

Step 1: Verify Project Costs and Calculate the Annual Cost of the Pollution control project

Step 2: Calculate Total Annualized Pollution Control Costs Per Household

Step 3: Calculate and Evaluate the Municipal Preliminary Screener Score-- identifies only entities that can pay for sure

If the public entity passes a significant portion of the pollution control costs along to private facilities or firms, then the review procedures outlined in Chapter 3 of this workbook should also be consulted to determine the impact on the private entities.

Step 4: Apply the Secondary Test - This measurement incorporates a characterization of the community's current financial and socioeconomic well-being

The ability of a community to finance a project may be dependent upon existing financial conditions within that community.

Step 5: Assess where the community falls in The Substantial Impacts Matrix - This matrix evaluates whether or not communities are expected to incur **substantial** economic impacts due to the implementation of the pollution control costs. If the applicant cannot demonstrate substantial impacts, then they will be required to meet existing water quality standards.

The evaluation of substantial impacts resulting from public entity compliance with water quality standards includes two elements, 1) financial impacts to the public entity and 2) current socioeconomic conditions of the community. Governments have the authority to levy taxes and distribute pollution control costs among households and businesses according to the tax base. Similarly, sewage authorities charge for services, and thus can recover pollution control costs through users fees. In both cases, a substantial impact will usually affect the wider community. Whether or not the community faces substantial impacts depends on both the cost of the pollution control and the general financial and economic health of the community.

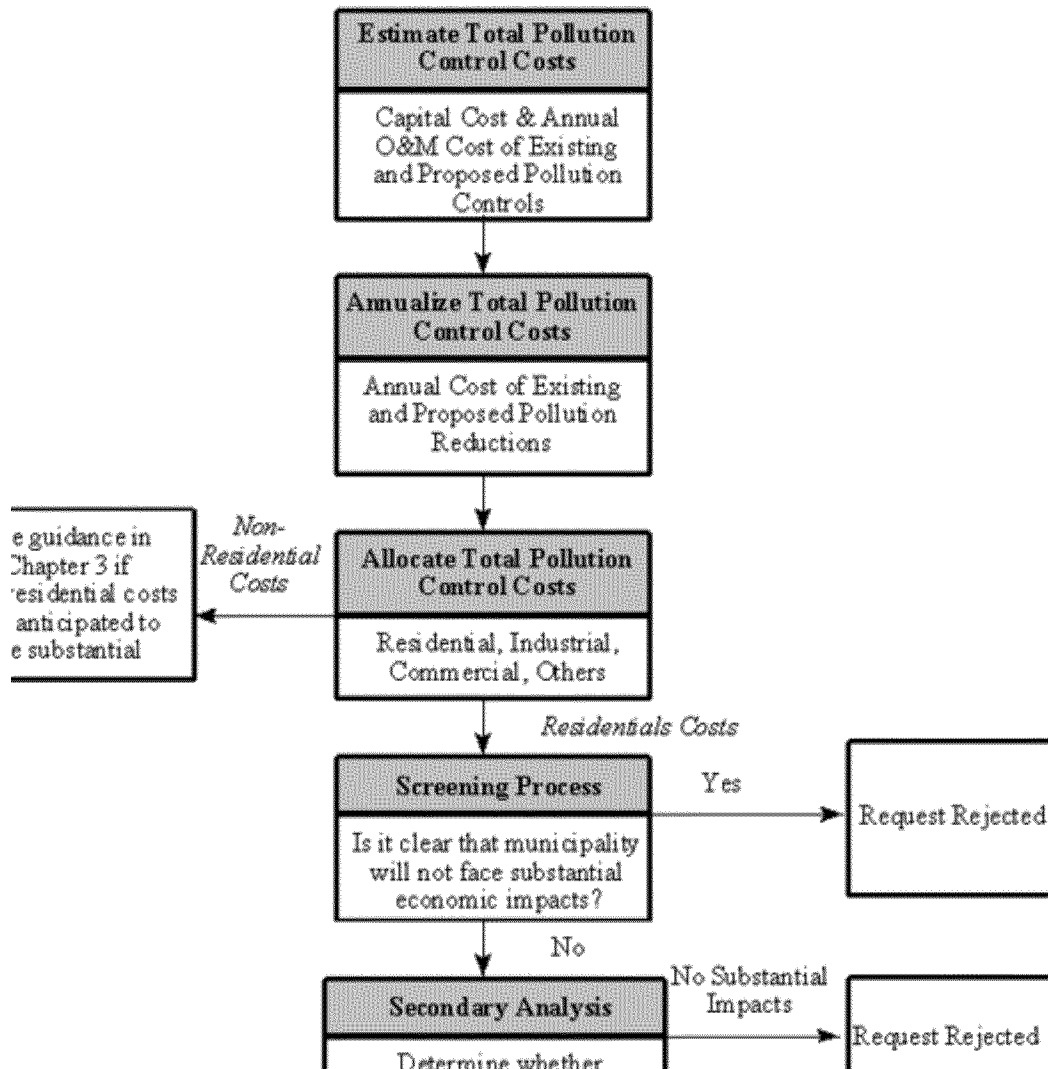
Us
(
non-
are
b

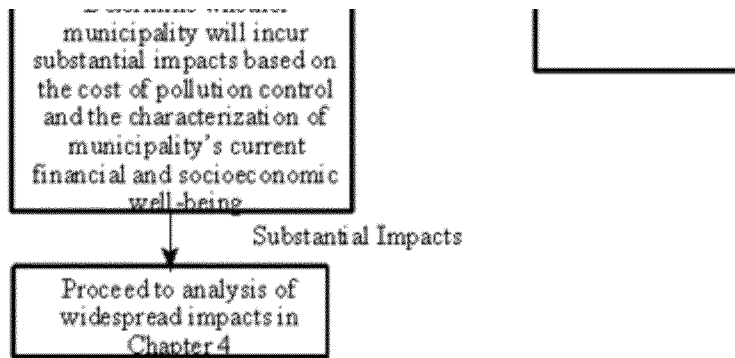
Step 6: If impacts are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be **widespread** (Go to "DEQ Widespread Criteria" tab). Estimated *changes* in socio-economic indicators will be used to determine whether widespread impact has occurred

needs to be taken for the
rough each of the
directly to the last tab.
out after you work

a public facility. Also
e EPA Guidance for Water
workbook/

**Figure 2-1:
Measuring Substantial Impacts
(Public Entities)**





you reach for each step for your analysis. This is help to give a simple overview of what you found out.

OVERALL STEPS SUMMARY

the Annual Cost of the Pollution control project	\$4.6 million total in capital costs/\$0.43 million per year in annualized costs
Step 2: Calculate Total Annualized Pollution Control Costs Per Household	\$1,876 per household per year for existing and new costs
Step 3: Calculate and Evaluate the Municipal Preliminary Screener Score-- identifies only entities that can pay for sure	5.83% which is large--There is a need to proceed to the Secondary Test
Step 4: Apply the Secondary Test - This measurement incorporates a characterization of the community's current financial and socioeconomic well-being	The secondary score for Circle came out to be 2.00 or mid-range
Step 5: Assess where the community falls in The Substantial Impacts Matrix - This matrix evaluates whether or not communities are expected to incur substantial economic impacts due to the implementation of the pollution control costs. If the applicant cannot demonstrate substantial impacts, then they will be required to meet existing water quality standards.	Circle cannot afford to pay for the new project according to the matrix so a widespread test is needed.
Step 6: If impacts are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be widespread (Go to "DEQ Widespread Criteria" tab).	The Widespread test suggests that Circle would suffer widespread economic and social impacts. This would argue for either a variance, an extended time table, or a different plan to meet standards
Step 7: State the Final Conclusion	Consider granting Circle a variance, an extended time table, or a different plan to meet standards

sults that you reach for each step for

Worksheet A--Pollution Control Project Summary Info

For the purposes of this workbook, a **public entity** refers to any governmental unit that must comply with pollution control requirements in order to meet water quality standards. The most common example is a municipality or sewage authority operating a publicly owned treatment works (POTW) that must be upgraded or expanded. Municipalities, however, may also be required to control other point sources or nonpoint sources of pollution within their jurisdiction.

Note: The most cost effective project is preferred. Public entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment. Specific types of pollution prevention activities that should be considered are found in Chapter 2 of the EPA Guidance.

Whatever the approach, the applicant must demonstrate that the proposed project is the most appropriate means of meeting water quality standards and must document project cost estimates. If at least one of the treatment alternatives that meets water quality standards will not have a substantial financial impact, then the community should not proceed with the analysis presented in the rest of this workbook.

Current Capacity of the Pollution Control System (skip this for Non-Deg)	0.5 MGD
Design Capacity of the Pollution Control System	0.75 MGD
Current Excess Capacity % (skip this for Non-Deg)	33%
Expected Excess Capacity after Completion of Project %	50%
Projected Groundbreaking Date	Jan-09
Projected Date of Completion	Jan-10

Please describe the pollution control project being proposed and how the project meets water quality standards:

ponds. This would include a sprayer to land apply the water after treatment. This would help Circle meet secondary standards.

Please describe the other pollution control options considered, explaining why each option was rejected. Explain how each alternative would have met water quality standards.

Modifying the lagoons would not be enough to meet the secondary standards.

Is the proposed project the least expensive that can be used to meet the water quality standards goals? If not, give reasons why it is not.

Yes

ment to complement existing lagoon ponds. This would include a sprayer to land apply the water after treatment.
e meet secondary standards.

s would not be enough to meet the secondary standards.

Worksheet B-Calculation of Total Annualized Project Costs

Note: The capital portion of project costs is typically financed over approximately 20 years, by issuing a municipal debt instrument such as a general obligation bond or a revenue bond. Local governments may also finance capital costs using bank loans, state infrastructure loans (revolving funds), or federal subsidized loans (such as those offered by the Farmers Home Administration)

If project costs were estimated for some prior year, these costs should be adjusted upward to reflect current year prices using the average annual national Consumer Price Index (CPI) inflation rate for the period

Capital Cost of Project	\$4,000,000	
Other One-Time Costs of Project (Please List, if any):	\$0	
Sprayers and piping	\$600,000	
	\$0	
	\$0	
	\$0	
Total Capital Costs (Sum column) \$ (1)	\$4,600,000	
Portion of Capital Costs to be Paid for with Grant Monies \$ (2) (Paul)	\$2,000,000	identified in the PER
Capital Costs to be Financed [Calculate: (1) - (2)] \$ (3)	\$2,600,000	
Type of financing (e.g., G.O. bond, revenue bond, bank loan)		
Interest Rate for Financing (expressed as decimal) (i)	0.06	The interest rate
Time Period of Financing (in years) (n)	20	
Annualization Factor = $i / [(1+i)^n - 1]$ + i (or see Appendix B) (4)	0.08718	depending on funding source. SRF is 125%
Annualized Capital Cost [Calculate: (3) x (4)] (5)	\$226,680	
<u>B. Operating and Maintenance Costs</u>		
Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below and state in terms of dollars per year)	\$200,000	
	\$0	
	\$0	
	\$0	
Total Annual O & M Costs (Sum column) \$ (6)	\$200,000	
<u>C. Total Annual Cost of Pollution Control Project</u>		
Total Annual Cost of Pollution Control Project [(5) + (6)] \$ (7)	\$426,680	

*g a municipal debt instrument such as a general
ans, state infrastructure loans (revolving funds), or*

current year prices using the average annual national

This should be a realistic amount and should be
identical to financing plans identified in the PER

te should reflect the type of debt instrument likely to be used.

loan coverage should be included - this applies to
revenue bonds and varies between 110 to 125%
depending on funding source. SRF is 125%

funding sources are Rural Development (U.S. Dept. of Ag.) -
they require 115% coverage - I think - and SRF. We require
125% coverage on all revenue bonds. You could probably just
roll this into annual debt, but if you tried to back calculate how
much a community could afford, it may complicate things.

US bonds are tax-backed. The
ment (U.S. Dept. of Ag.) - they
ire 125% coverage on all revenue
al debt, but if you tried to back
, it may complicate things.

Worksheet C-Calculation of Total Annual Pollution Control Costs Per Household

A. Current Pollution Control Costs:

Current sewer rate

Total Annual Cost of Existing Pollution Control \$ (1)	\$55,500
Amount of Existing Costs Paid By Households \$ (2)	\$55,500
Percent of Existing Costs Paid By Households %(3)	100.00%
Number of Households* (4)	257
Annual Cost Per Household [Calculate: (2)/(4)] \$ (5)	\$216

* Do not use number of hook-ups.

B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

a) Yes [fill in percent from (3)] percent.(6a)

b) No, they are expected to pay _____ percent.(6b)

c) No, they are expected to pay based on flow. (Continue on Worksheet C, Option A--
See below)

_____ X

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B] \$ (7)

Proportion of Costs Households Are Expected to Pay [(6a) or (6b)] (8)

Amount to Be Paid By Households [Calculate: (7) x (8)] \$ (9)

Annual Cost per Household [Calculate: (9)/(4)] \$ (10)

C. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control Per Household (5) + (10) \$ (11)

Worksheet C: Option A---Flow based (Not Applicable for Circle)

Calculation of Total Annual Pollution Control Costs Per Household--Flow based

A. Calculating Project Costs Incurred By Households Based on Flow

Expected Total Usage of Project (eg. MGD for Wastewater Treatment)	0.75	
		(1)
Usage due to Household Use (MGD of Household Wastewater)	0.75	
		(2)
Percent of Usage due to Household Use [Calculate: (2)/(1)]	100.00%	
		(3)
Total Annual Cost of Pollution Control Project	\$426,680	
		(4)
Industrial Surcharges, if any	\$0	
		(5)
Costs to be Allocated [Calculate: (4) - (5)]	\$426,680	
		(6)
Amount to Be Paid By Households [Calculate: (3) x (6)]	\$426,680	
		(7)
Annual Project Cost per Household [Calculate: (7)/Worksheet C, (4)]	\$1,660	
		(8)

C. Total Annual Pollution Control Cost Per Household

Annual Existing Costs Per Household [Worksheet C, (5)]	\$216	
		(9)
Total Annual Cost of Pollution Control Per Household [(8) + (9)]	\$1,876	
		(10)

Lagoons

(Extrapolating from Census 2000, Susan Ockert)

According to the 2000 census there were 291 households with a population of 644. See <http://www.ceic.mt.gov/C2000/SF32000/SF3places/sfpData/1603014950.pdf>. However the estimated population in Circle in 2006 was 569. With an average household size of 2.21, the number of potential households in 2006 would be 257. Susan Ockert

Worksheet D-Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

Total Annual Pollution Control Cost per Household/Median Household Income X 100

A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or \$ (1) Worksheet C, Option A (10)]

\$1,876

Median Household Income* \$ (2)

(use CPI to update income number to current year)

\$32,162

should be identic

Municipal Preliminary Screener (Calculate: [(1)/(2)] x 100) %(3)

B. Evaluation of The Municipal Preliminary Screener

5.83%

Impact level is (Little, mid-range, large)

Large

Impact Continue on to secondary test

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

Little Impact

Less than 1.0%

Mid-Range Impact


1.0% - 2.0%

Indication of no substantial economic impacts

Proceed to Secondary Tests

al to that stated in PER

Large Impact
Greater than 2%



Worksheet E-Data Used in the Secondary Test

community. Use the latest data available for the community or other public jurisdiction being analyzed.

A. Data Collection

Data	Potential Source
Direct Net Debt--Debt Issued directly by the local jurisdiction (1)	Community Financial Statements Town, County or State Assessor's Office \$ _____
Overlapping Debt (such as school districts)? (2)	Community Financial Statements Town, County or State Assessor's Office \$ _____
Market Value of Property within the community or service area (3)	Community Financial Statements \$ _____ Town, County or State Assessor's Office
Bond Rating-(if available) (4)	Standard and Poors or Moody's _____
Community Unemployment Rate (5)	Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC _____ %
National Unemployment Rate (6)	Bureau of Labor Statistics 4.7% (6)

<http://www.bls.gov/>
(202) 606-6392

Community Median Household
Income for 2006 (7)

\$ _____

State Median Household Income
(8)

\$37,307 for State
of Montana

Property Tax Collection Rate
(Indicator of the efficiency of the
tax collection system--compares
the actual amount collected from
property taxes to the amount
levied) (9)

Community Financial
Statements

_____ %

Property Tax Revenues (10)

Town, County or State
Assessor's Office

Community Financial
Statements

\$ _____

Town, County or State
Assessor's Office

Full Market Value of taxable
property

\$ _____

B. Calculation of Indicators

1. Overall Net Debt as a Percent of Full Market Value of Taxable Property

Overall Net Debt (Calculate: (1) +
(2)) (11)

\$ _____

Overall Net Debt as a Percent of
Full Market Value of Taxable
Property (Calculate: [(11)/(3)] x
100) (12)

_____ %

2. Property Tax Revenues as a Percent of Full Market Value of Taxable Property

Property Tax Revenues as a
Percent of Full Market Value of
Taxable Property (Calculate:
[(10)/(3)] x 100) (13)

_____ %

ates the community's ability to obtain financing and describes the socioeconomic health of
ction being analyzed.

Value	Source
\$1,036,000	carol markenson- (406) 485-2524
\$25,156,614	Tax Year 2007 Source: DOR-TPR Mary Craigle
No bond	carol markenson- (406) 485-2524
2.4%	Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC
4.7%	http://www.bls.gov/

\$32,162 Susan Ockert-CEIC
extracted from
Decision Data
resources

\$37,307 Susan Ockert-CEIC
extracted from
Decision Data
resources

93.15% carol markenson-
(406) 485-2524

\$134,510 Tax Year 2007
Source: DOR-TPR
Mary Craigle

\$25,156,614 Tax Year 2007
Source: DOR-TPR
Mary Craigle

\$1,036,000

4.12%

0.53%

Worksheet F- Calculating the Secondary Score

The Secondary Test is designed to build upon the characterization of the financial burden identified in the Municipal Preliminary Screener. The Secondary Test indicates the community's ability to obtain financing and describes the socioeconomic health of the

Remember, if one of the debt or socioeconomic indicators is not available, average the two financial management i Please record the scores in the final column. It will sum the scores and compute an average.

Table 2-1 Secondary Indicators

		Secondary Indicators			
		Indicator	Weak*	Mid-Range**	Strong***
Debt Indicators		Bond Rating (if available)	Below BBB (S&P)	BBB (S&P)	Above BBB (S&P) or Baa (Moody's)
			Below Baa (Moody's)	Baa (Moody's)	
		Overall Net Debt as Percent of Full Market Value of Taxable Property	Above 5%	2%-5%	Below 2%
SocioEconomic Indicators		Unemployment	More than 1% above National Average	National Average----4.7%	More than 1% below National Average
		Median Household Income	More than 10% below State Median	State Median-- \$37,307	More than 10% above State Median
Financial Management Indicators		Property Tax Revenues as a Percent of Full Market Value of Taxable Property	Above 4%	2%-4%	Below 2%
		Property Tax Collection Rate	< 94%	94% - 98%	> 98%

* Weak is a score of 1 point

** Mid-Range is a score of 2 points

*** Strong is a score of 3 points

SUM:

AVERAGE:

<http://www.epa.gov/waterscience/standards/econworkbook/table21.html>

burden than the financial management indicators. Consequently, if one of the debt or socioeconomic indicators is not available, the applicant should average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators. This averaging is necessary so that undue weight is not given to the financial management indicators.

0011294

....., we apply averaging to
use this averaged value as a single indicator with the remaining indicators. This averaging
is necessary so that undue weight is not given to the financial management indicators.

indicators and use this averaged value as a single indicator with the remaining indicators.

Circle
Score
N/A
2
3
1
3
1

10

2.00

of the six indicators, they must appropriate or not available. Since n to the community, the debt and sures of burden than the financial t or socioeconomic indicators is cial management indicators and maining indicators. This averaging ancial management indicators.

.....
remaining indicators. This averaging
financial management indicators.

Assessment of Substantial Impacts Matrix

Table 2-2

Assessment of Substantial Impacts Matrix

	Municipal Preliminary Screener		
	Less than 1%	1% to 2%	Greater than 2%
Secondary score			
Less than 1.5	?	X	X
Between 1.5 and 2.5	\$?	X
Greater than 2.5	\$	\$?

Result: necessary in order to determine whether a variance should be given on economic grounds.

X-Cannot pay due to hardship
?-Borderline, undetermined
\$-Can pay

Communities falling into either the "X" or the "?" category should proceed to Chapter 4 to determine whether the impacts are also expected to be widespread.

For communities that fall into the "?" category, if the results of both the Secondary Test and the Municipal Preliminary Screener are borderline, then the community should move into the category closest to it. Take, for example, a community that falls into the center box, with a cumulative assessment score of between 1.5 and 2.5 and a percent of median household income (MHI) between 1.0 and 2.0. If the cumulative score was 1.6 and the percent of MHI was 1.8, then the community should be considered to fall into one of the adjacent "X" categories. If results are not borderline, other factors such as the impact on low or fixed income households, the presence of a failing local industry, and other projects the community would have to forgo in order to comply with water quality standards should be considered. Relevant additional information might include information collected from interviews with municipal financial officers, special reports on industry trends that may affect local employers, and specific financial and economic indicators. The State/discharger should provide any additional information they feel is relevant. This additional information will be critical where the matrix results are not conclusive.

, the matrix indicates that they may have trouble paying for the
tion control. Thus, a Widespread determination is necessary in
etermine whether a variance should be given on economic

category should proceed to
also expected to be widespread.

DEQ Widespread Criteria - Factors to Consider in Making a Determination of Wide

private) or group of dischargers will have difficulty paying for pollution controls, then an additional analysis must be performed to demonstrate that there will be widespread adverse impacts on the community or surrounding area. There are no economic ratios per se that evaluate socioeconomic impacts. Instead, the relative magnitudes of indicators such as increases in unemployment, losses to the local economy, changes in household income, decreases in tax revenues, indirect effects on other businesses, and increases in sewer fees for remaining private entities should be taken into account when deciding whether impacts could be considered widespread. Since EPA does not have standardized tests and benchmarks with which to measure these impacts, the following guidance is provided as an example of the types of information that should be considered when reviewing impacts on the surrounding community.

pass through to the local economy), consider the baseline economic health of the community, and finally evaluate how the proposed project will affect the socioeconomic well-being of the community. Applicants should feel free to consider additional measures not mentioned here if they judge them to be relevant. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally, rather, their cumulative effect on the community should be assessed.

Answer as many of the following questions as possible and see the additional instructions below:

INPUT CATEGORY	Weight of Importance	
Define the affected study area or community (1)	Most Important	Town of Circle
Describe the general economic trend in the study area or community--qualitatively or quantitatively. Name the main industry(s) and if any major industries are intending to enter the area or leave the area. What is the current health of that main industry(s)? (2)	Most Important	cycle is happening right now. No new businesses are moving in.
Indicate the general population trend in the area. Is the community growing or shrinking? Specifically state if young people are staying in the area or leaving after they graduate school (3)	Most Important	people are leaving town.
Describe how the economy in general would be affected, if at all, by having to meet requirements. Potential effects, for example, could be changes in median income and/or unemployment. (4)	Most Important	to spread out the new costs to keep rate down at a low level.
How would the unemployment rate in the study area be affected, if at all, by having to comply with numeric nutrient standards? How would this affect the unemployment rate in comparison to the national average which is 4.7% (Source: Montana Department of Labor and Industry, Research and Analysis Bureau, Local Area Unemployment Statistics compiled by CEIC) ? (5)	Important	could only be affected if businesses leave Circle due to higher

Approximately how many more individuals would become unemployed, if any, as a result of having to meet numeric nutrient standards? Are there other ample job opportunities to take up the slack (refer to current unemployment rate in Secondary test)? (6)	Important	ample job opportunities to take up the slack.
What would be the estimated change in Median Household Income, if any, as a result of having to comply with numeric nutrient standards? Describe qualitatively and/or quantitatively. If any change, how would this affect the Median Household Income in comparison to the state median which is \$37,307 (Source: Susan Ockert, CEIC, extracted from Decision Data Resources)? (7)	Important	affected most likely, but household budgets would be squeezed
Percent of households below the poverty line in the affected community and a comparison to the state average of 21.6% (8)	Important	19.8%---€
What would be the estimated change in (8) as a result of having to comply with water quality standards and would that change the comparison to the Montana average? The Montana average percent of households below the poverty line is 21.6% or 80,556 homes out of 372,190 (Source: U.S. Census Bureau, 2006 American Community Survey, POVERTY STATUS OF MONTANA HOUSEHOLDS: 2006, Susan Ockert, CEIC) (9)	Important	cross to poverty would experience more financial difficulty as a result.
Expected increase in social services in affected community, if any, if water quality standards have to be met. This can be answered as a change in dollars, a change in percent from current expenditures, or qualitatively if no data exists. (10)	Important	experience the brunt of the impacts.
If applicable, what would be the estimated change in overall net debt of the municipality as a percent of full market value of taxable property as a result of having to meet numeric nutrient standards? (11)	Important	load for such a small town.
What would be the impact on property values within the affected area, if any, from having to meet numeric nutrient standards? (12)	Important	This is unlikely.
What would be the Impact on community and/or commercial development potential in the study area, if any, from having to meet numeric nutrient standards? (13)	Important	Probably i
Is a large percentage of the wastewater treatment plant used by one or a few entities that would be affected by water quality standards? If yes, and these entities closed down as a result of pollution control costs, would significant burden be placed on the rest of the users of that system? (14)	Important	No
Would expenditures on pollution controls to reach attainment have any positive effects on the community? (15)	Important	meeting water quality standards.

If appropriate, would there be any multiplier effects from cost or benefits as a result of having to meeting numeric nutrient criteria? In other words will a dollar lost or gained as a result of the criteria result in the loss or gain of more than one dollar in the study area (e.g. direct and indirect spending)? (16)

Most important

significant
in a small
town with
few
businesses.

(For non-deg only). In the case of non-degradation, what is the community's majority opinion on growth and/or the entity coming into the town/region and building a facility? What is the community's majority opinion on degradation of the receiving stream's high quality water? (17)

Most Important (non-deg)

Is there any additional information that suggests that there are unique conditions in the affected community that should also be considered? (18)

Important

Based on the criteria you just filled out and on your own judgement, will this community experience widespread impacts? Please describe how you reached this decision.

way to
meet
standards,
or obtain
more
government
grants.

ARRIVING AT A CONCLUSION: The main question to ask is whether widespread economic impacts are likely to occur in the study area as a result of attempting to comply with numeric nutrient standards? (yes/no) The key aspect of a "widespread determination" is that it evaluate change in the socioeconomic conditions that would occur as a result of compliance (EPA 1995).

The analyst should take into account as many of the factors listed above as possible when making a decision on whether impacts are widespread. The decision should be made based on all appropriate factors in a comprehensive manner (rather than as a checklist). The analyst will use his or her judgement on whether all the factors taken together (including some that may not be on this list) constitute widespread impact. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally; rather, their cumulative effect on the community should be assessed as a whole. Applicants should feel free to use anecdotal information to describe any current community characteristics or anticipated impacts that are not listed in the worksheet.

The analyst may want to weight some of these factors more than others. In some cases, the results from a single category might be sufficient to determine whether widespread impacts will occur, even if other factors suggest differently. These categories are weighted by how important they are relative to the general idea "widespread" is attempting to address, although the analyst can use their own weights if supported by evidence.

In most cases, impacts at the state level will be relatively minor. If not, then impacts are, BY DEFAULT, widespread

There may be secondary impacts from having to meet numeric nutrient standards (not captured by the primary and secondary tests to the community). Secondary impacts, for example, might include depressed economic activity in a community resulting from the loss of purchasing power by persons losing their jobs or leaving the area due to increased user fees.

Reductions in employment caused by compliance with the water quality standards could be widespread if workers have no other employment opportunities nearby. Impacts may also be significant where the public entity(ies) is a primary producer of a particular product or service upon which other nearby businesses or the affected community depend. The impacts of reduced business activities or closure will be far greater in this case than if the products are sold elsewhere.

Potentially, one of the most serious impacts on the affected community's economy is the loss of employment caused by a reduction in business activity or closure. Applicants should also consider whether the lack of alternative employment opportunities may lead to an increased need for social services in the affected community.

spread Social and Economic Impacts

ious socioeconomic impacts. If the financial tests outlined in Chapter 2 and 3 suggest that a
s, then an additional analysis must be performed to demonstrate that there will be widespread
evaluate socioeconomic impacts. Instead, the relative magnitudes of indicators such as increases in
nues, indirect effects on other businesses, and increases in sewer fees for remaining private entities
nce EPA does not have standardized tests and benchmarks with which to measure these impacts,
ered when reviewing impacts on the surrounding community.

ct costs pass through to the local economy), consider the baseline economic health of the
of the community. Applicants should feel free to consider additional measures not mentioned here if
In all cases, socioeconomic impacts should not be evaluated incrementally, rather, their cumulative

The Town of Circle

Circle's economy is on a long-term general decline. It's
economic output is growing/shrinking at ___% per year
which is lower than the state average. Ag, ranching and
retail are the largest industries, and tend to go through
boom and bust cycles. A short boom cycle is happening
right now. No new businesses are moving in.

Circle is losing population. It's population has declined an
estimated 11.6% from 2000-2006. The majority of its
young people are leaving town.

The economy, which is already suffering, could be hit hard
by the higher wastewater rates. It is possible that
employment could be slightly affected by the rates if some
people or businesses left. More importantly, household
budgets would be hit hard. There are not enough
households in Circle to spread out the new costs to keep
rate down at a low level.

Unemployment would only be affected if businesses leave
Circle due to higher wastewater costs--unlikely.

A small chance that a few might be unemployed--probably less than 10. There are not ample job opportunities to take up the slack.

The median household income would not be affected most likely, but household budgets would be squeezed by the new high costs--almost \$2,000 per year.

ow state average
19.8%---about 10 percent below state average

Probably no effect, because household income is not expected to change. However, some households in poverty or close to poverty would experience more financial difficulty as a result.

There could be a slight increase for those households that experience the brunt of the impacts.

The change would be very large--an increase of about 250% (\$2.6 million dollars) from the current 4.55% up to around 14% which is a high debt load for such a small town.

There could be a drop in property values if enough people leave. This is unlikely.

t trends.

Probably no effect from current trends.

No

They would expand room for future development and population increase while meeting water quality standards.

These could be significant. Households would have less money to spend on other goods, and those effects could be significant in a small town with few businesses.

—

what if triggering nondeg is a result of just general growth in the c

—

This community would likely experience widespread impacts in terms of having substantial expenses and the resulting multiplier effects on the businesses there. This would be a financial blow on a town struggling to make things work. An argument could be made to find a cheaper way to meet standards, or obtain more government grants.

ommunity?

Appendix C-Conceptual Measure of Economic Benefits of Clean Water (Optional)

example, in a rural community where the primary source of employment is agriculture, the reduction of fertilizer and pesticide runoff from farms would reduce the cost of treating irrigation water to downstream users. Another example might be an industrial facility discharging its wastewater into a stream that otherwise could be used for recreational cold-water fishing. Treatment or elimination of the industrial wastewater would provide a benefit to recreational fishermen by increasing the variety of fish in the stream. In both cases, the economic benefit is the dollar value associated with the increase in beneficial use or potential use of the waterbody. The types of economic benefits that might be realized will depend on both the characteristics of the polluting entity and characteristics of the affected community, and should be considered on a case by case basis.

to which benefits can be considered in the economic impact analysis. This determination should be coordinated with the EPA Regional Office. A more detailed description of the types of benefits that might be considered is given in Appendix C. This appendix is not intended to provide in-depth guidance on how to estimate economic benefits; rather, it is intended to give States an idea of the types of benefits that might be relevant in a given situation.

between the intrinsic value of the existence of the resource and its value in use by the human population. Use values are further subdivided into direct or indirect uses. Other valuation concepts arise from the uncertainty surrounding future uses and availability of the resource. A classification of these valuation concepts, along with examples, is presented in Table C-1 below.

C.1 Use Benefits

resource and its uses. A waterbody might be used for recreational activities (such as fishing, boating, swimming, hunting, bird watching), for commercial purposes (such as industrial water supply, irrigation, municipal drinking water, and fish harvesting), or for both. Where recreational activities are created or enhanced due to water quality improvements, the public will benefit in the form of increased recreational opportunities. Similarly, the cost of treating irrigation and drinking water to down stream users could be reduced if pollutant discharges were reduced or eliminated in a particular stretch of river.

non-consumptive uses in that the former excludes other uses of the same resource while the latter does not. For example, water is consumed when it is diverted from a waterbody for irrigation purposes. With non-consumptive uses, however, the resource base remains in the same state before and after use (e.g., swimming). Human health benefits associated with cleaner water could be consumptive (reduced illness from eating finfish or shellfish) or non-consumptive (reduced exposure to infectious diseases while recreating).

its use). For example, commercial fisheries have a market value reflected by the financial value of landings of a particular species. By contrast, no market exists to describe the value individuals receive from swimming. Where market values are available, they should be used to estimate benefits. In the case of water supply, there may or may not be a market for clean water. Some water users may be required to pay for that use as in the case of a farmer paying a regional water board to divert water for irrigation purposes. This will be particularly true in the arid west. By contrast, a manufacturing facility using water for cooling or process water may not pay anything for the right to pump and use water from an adjacent river. For resources with no market value, a number of estimation techniques including the travel cost, estimation from similar markets, and contingent valuation methods have been developed.

while they are conceptually distinct attributes, consumptive use is frequently associated with markets and non-consumptive use is frequently associated with non-market situations. Some resources that are considered market resources, however, may be used non-consumptively. The converse is also true. As an example of the first, a fee may be charged (other than parking) to gain entrance to a state park, however, while a swimmer's use of a lake in the park is not consuming any part of the lake.

indirect use. Examples would be a fishing equipment manufacturer's dependence on healthy fish stocks to induce demand for its products or the dependence of property values on the pristine condition of an adjacent water body. Indirect use is also characterized by the scenic views and water enhanced recreational opportunities (camping, picnicking, birdwatching) associated with the quality of water in a water body. Indirect use benefits such as enhanced property values can be estimated using the hedonic price technique. Care should be taken, however, to not double-count benefits. If property values reflect the proximity to and thus use of water, then the value of the use should not be included separately.

C.2 Intrinsic Benefits

the resource. Intrinsic benefits are represented by the sum of existence and option values. Existence value indicates an individual's (and society's) willingness to pay to maintain an ecological resource such as clean water for its own sake, regardless of any perceived or potential opportunity for that individual to use the water body now or in the future. Contributions of money to save endangered species such as the snail darter demonstrate a willingness to pay for the existence of an environmental amenity despite the fact that the contributors may never use it or even experience it directly.

routinely pay to store or transport something they are not sure they will use in the future because they recognize it would be more costly to recreate the item than to preserve it. In an ecological sense, pristine habitats and wildlife refuges are often preserved under the assumption that plant or animal species which may yield pharmaceutical, genetic, or ecosystem benefits are yet to be discovered. Option value takes on particular importance when proposed development or environmental perturbations are largely irreversible or pollutants are persistent. Intrinsic benefits are difficult to measure due to the level of uncertainty associated with these benefits. The most common approach to estimating intrinsic benefits, however, is the contingent valuation method, which cannot be described in detail within this short overview.

C.3 Summary: Summarize the Water Quality Benefits of this pollution control project

Total valuation of clean water benefits includes all use and existence values as well as option value. The proper framework for estimating the economic benefits associated with clean water consists of 1) determining when damage first occurs or would occur; 2) identifying and quantifying the potential physical/biological damages relative to an appropriate baseline; 3) identifying all affected individuals both due to potential loss of direct or indirect services or uses, and to potential losses attributable to existence values (may include projections for growth in participation rates); 4) estimating the value affected individuals place on clean water prior to potential degradation; and 5) determining the time horizon over which the waterbody would be degraded or restored to some maximum reduced state of service (if ever), and appropriately discounting the stream of potential lost services. If evaluating an improvement in water quality, the procedures are the same except that benefits gained are measured.

Table C-1: Categories of Use Benefits

Direct	Indirect	Intrinsic
Consumptive:	Fishing Equipment Manufacturer	Option Value (access to resource in future) Existence Value (knowledge that services of resource exist)
Market Benefits	Property Values	
Industrial Water Supply Agricultural Water Supply Municipal Water Supply	Aesthetics (scenic views, water enhanced recreation)	

Commercial Fishing

Non-Market Benefits

Recreational Fishing

Hunting

Industrial Water Supply

Agricultural Water Supply

Municipal Water Supply

Non-Consumptive:

Swimming

Boating

Human Health

water. For example, in a rural community where the
would reduce the cost of treating irrigation water to
stream that otherwise could be used for recreational
recreational fishermen by increasing the variety of fish
beneficial use or potential use of the waterbody. The
ing entity and characteristics of the affected

the extent to which benefits can be considered in
e. A more detailed description of the types of
depth guidance on how to estimate economic
a given situation.

trade between the intrinsic value of the existence of the
or indirect uses. Other valuation concepts arise from the
concepts, along with examples, is presented in Table C-

of the resource and its uses. A waterbody might be used
purposes (such as industrial water supply, irrigation,
enhanced due to water quality improvements, the public
and drinking water to down stream users could be

ished from non-consumptive uses in that the former
when it is diverted from a waterbody for irrigation
and after use (e.g., swimming). Human health benefits
r non-consumptive (reduced exposure to infectious

s case clean water) can be considered market or non-
mercial fisheries have a market value reflected by the
individuals receive from swimming. Where market values
y not be a market for clean water. Some water users may
r for irrigation purposes. This will be particularly true in the
anything for the right to pump and use water from an
travel cost, estimation from similar markets, and contingent

and non-consumptive use is frequently associated with
l non-consumptively. The converse is also true. As an
ver, while a swimmer's use of a lake in the park is not

fit from indirect use. Examples would be a fishing
e dependence of property values on the pristine condition
l recreational opportunities (camping, picnicking,
nced property values can be estimated using the hedonic
ct the proximity to and thus use of water, then the value of

ent use of the resource. Intrinsic benefits are represented
willingness to pay to maintain an ecological resource such
to use the water body now or in the future. Contributions
the existence of an environmental amenity despite the fact

water in known or as yet unknown ways. In a sense it is a
ing they are not sure they will use in the future because
, pristine habitats and wildlife refuges are often preserved
stem benefits are yet to be discovered. Option value takes
versible or pollutants are persistent. Intrinsic benefits are
approach to estimating intrinsic benefits, however, is the

**value. The proper framework for estimating the
rst occurs or would occur; 2) identifying and
identifying all affected individuals both due to
existence values (may include projections for
water prior to potential degradation; and 5)
me maximum reduced state of service (if ever),
ement in water quality, the procedures are the
d.**

Non-Degradation for a Public Entity

allows the public to make decisions about important environmental actions. Where the State intends to provide for development, it may decide that some lowering of water quality in "high-quality waters" is necessary to accommodate important economic or social development. Any such reduction in water quality, however, must protect existing uses fully and must satisfy the requirements for intergovernmental coordination and public participation.

To determine if water quality can be lowered for a new public development, the same tests are used as in this work

Question:

(1) Will the pollution controls needed to maintain the high-quality water interfere with the proposed public development? (Analogous to secondary test for substantial effects)

(2) Is the proposed public development important economically and socially to the study area? (Analogous to Wide

The tests used to demonstrate interference and importance are the same as those used to demonstrate substantial and widespread. The difference is, however, that an antidegradation review considers situations that would improve the current economic condition.

If the answer is no to either 1 or 2 above, then the analysis is over---no degradation of water quality is necessary. by the pollution controls necessary to prevent degradation *is* an *important* economic and social development.

To answer question (1), please complete Worksheets A through E, and the Substantial Impacts Matrix.

To answer question (2), please complete Worksheet M and the DEQ Widespread Criteria worksheet.

Complete the summary information on tab X.

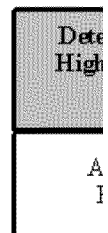
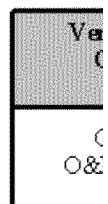
An antidegradation review must determine that the lowering of water quality is necessary in order to accommodate social development in the area in which the waters are located.

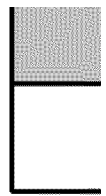
While the terminology is different, the tests to determine substantial and widespread economic impacts (used when removing a use or granting a variance) are basically the same as those used to determine if there might be interference with an important social and economic development (antidegradation). As such, antidegradation analysis is the mirror image of the analyses described in Chapters 2, 3 and 4. Variances and downgrades refer to situations where additional treatment needed to meet standards may result in worsening economic conditions; while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions.

When performing an antidegradation review, the first question is whether the pollution controls needed to maintain the high-quality water will interfere with the proposed development. If not, then the lowering of water quality is not warranted. If, on the other hand, the pollution controls will interfere with development, then the review must show that the development would be an important economic and social one. These two steps rely on the same tests as the determination of substantial and widespread impacts.

The analytic approach presented here can be used for a variety of public-sector and private sector entities, including POTWs, commercial, industrial, residential and recreational land uses, and for point and nonpoint sources of pollution.

Anti





Qu
red
anc

policy that allows the public to make decisions about
side that some lowering of water quality in "high-quality
action in water quality, however, must protect existing
ipation.

sheet. However, the question is slightly different.

d public development? (Analogous to secondary test

spread Impacts Test)

ferred with by the pollution controls necessary to

Matrix.
sheet.

important economic or

Figure 5-1:
degradation Review

